# Dental

# Abstracts

*A selection of world dental literature / Volume 4 · Number 1 · January 1959*

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# Dental Abstracts

*A selection of world dental literature*

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Pedodontics

## Rickets, a vitamin deficiency disease with oral manifestations

Zoltán Kovács. *Gyermekgyógyászat* 56:195-214 April 1958

Rickets sometimes occurs in children between 6 and 24 months old. Because the changes in osseous tissue of the entire body overshadow those appearing in the oral cavity, rickets was thought to belong to the field of pediatrics rather than to pedodontics.

Serial dental examinations of Hungarian preschool and school children with a history of rickets, carried out at the Dental School of the University of Budapest, revealed that the enamel of the deciduous as well as of the permanent teeth had undergone hypoplastic changes which produced rough and pitted surfaces. In most instances the teeth were comparatively well formed but the palate was unusually high, the intermaxillary bones exerted a pressure in an anterior direction which caused the upper anterior teeth to protrude. The lower jaw, however, was incompletely developed and curved in a downward direction because of forces exerted by the depressor muscles.

An anterior cross bite was the most commonly observed complication but other types of malocclusion were present in a far higher frequency than was observed in normal children. However, a comparatively low frequency of dental caries was observed.

In the children examined rickets obviously was caused by the deficiency of vitamin D, calcium and phosphorus in the usual Hungarian diet.

Retardation in the eruption of both the deciduous and permanent dentition, facial asymmetry, an increase in the number of interglobular spaces (irregular cavities in the regions of the neck of the teeth and along the roots where the dentinal canals terminate), and broadened layers of predentin seemed to be the main maxillofacial manifestations associated with rickets. Tooth deformities and certain types of malocclusions also have a relation to this vitamin deficiency disease.

Unfortunately, however, the pediatrician or the orthopedist observes and treats the children with rickets before the pedodontist examines them. At the time of the dental examination, the oral manifestations associated with rickets are often irreversible. Prevention of rickets and thereby of its oral manifestations is one of the aspects of pedodontic treatment which should not be overlooked.

*Cserhát Utca 21, Budapest 7, Hungary*

*Extreme open bite in an eight year old Hungarian school girl with rickets. Hypoplasia in the enamel, characteristically crescent shaped (not carious) in the occlusal surface of all incisors*

### Thumbsucking and malocclusion

T. Rákosi. *Bratislav.lekár.listy* 38:36-40 Jan. 15, 1958

A serial analysis of the teeth of 693 preschool children (girls and boys, from three to six years old) was made at the Dental School of the University of Košice, Czechoslovakia.

The study represented an attempt to demonstrate the effect of continued thumbsucking on the developing dentition. The chi-square test was used as a statistical method of analysis to determine the significance of the data obtained. This method of analyzing, testing and recording revealed that thumbsucking causes a specific malocclusion, usually involving the anterior part of the upper dental arch. In isolated instances, this type of deformity seems to correct itself in the deciduous dentition if the duration of the habit is less than four years. If the habit persists for more than four years, however, the deformity is maintained in the deciduous dentition and is sometimes transferred to the permanent dentition. In the majority of instances, there seems to be a demonstrable tendency in the permanent dentition to overcome gradually the harmful influences of prolonged thumbsucking on the occlusion.

The four year period of the duration of the thumbsucking, however, does not appear to be an extremely critical etiologic factor of malocclusion.

In 280 Czech children with normal occlusion, it was established that 168 (60 per cent) had discontinued the habit of thumbsucking after a duration of less than two years. In 413 children with malocclusion, it was established that 354 (about 85 per cent) had continued thumbsucking for more than four years. In those children, thumbsucking as a causative factor in the development of malocclusion (especially Angle's Class II malocclusion, Divisions 1 and 2) cannot be ruled out.

The following factors should be considered in the prevention and treatment of malocclusions: (1) the length of time of breast feeding; (2) the degree of calcification of the infant's skull at birth; (3) the length of time of continued thumbsucking; (4) the manner of mastication and deglutition; (5) the presence and duration of other habits such as mouth breathing, nailbiting and sucking of other fingers, and (6) the presence of defects of speech, hearing or vision.

These factors as well as various other conditions, which may or may not be related to the developing dentition, deserve further study and evaluation as more data are collected in projected future studies.

*Stomatologickej Kliniky, University of Košice, Czechoslovakia*

### The edentulous interval

Peter Adler. *Stoma* 10:137-150 Aug.-Oct. 1957

The "edentulous period" between the shedding of the deciduous teeth and the eruption of their permanent successors was studied at the Dental School of the University of Debrecen, Hungary.

The pertinent and accessible reports on this specific subject, appearing in international dental and medical literature, were reviewed and evaluated.

A selected group of Hungarian school children of both sexes in whom the influence of extraction of deciduous teeth was minimal was studied. The following factors were recorded: (1) shedding time of the deciduous dentition; (2) time of the edentulous interval; (3) eruption time of the permanent dentition; (4) order of eruption of the permanent teeth, and (5) incidence of premature loss of deciduous and permanent teeth.

During the shedding and replacement processes of the same tooth category, the maximal permissible duration of the edentulous interval showed slight variations only. There were no significant differences between early, normal and late eruptions. It was established that in this group, the deciduous teeth were shed earlier and the permanent teeth erupted sooner than has been reported in world literature. The longer the duration of the edentulous interval, the greater the probability of malposition. The order of eruption of permanent cuspids and bicuspids, however, has no significant influence on the development of malocclusion.

Premature loss of deciduous teeth usually will result in premature eruption of permanent teeth.

Variations in the duration of the edentulous interval were found to be considerably smaller than variations in other phenomena of the changing dentition. The maximal permissible duration of the edentulous interval, therefore, seems to be a

reliable criterion in the diagnosis of disturbances occurring during the shedding and replacement processes.

Further studies with a far larger number of children are required in order to accumulate sufficient analytical and statistical data from which conclusive deductions can be made.

*Stomatological Clinic of the University, Debrecen, Hungary*

## Balanced premedication in pedodontics

Norman Buckman. *D.Health Memo.U.S.P.H.S.* 3-4 March 15, 1958

A safe, reliable, easily administered method of premedication for use on selected pedodontic outpatients consists primarily of pentobarbital, scopolamine (hyoscine) hydrobromide and meperidine hydrochloride. By this method the children are relaxed and will submit readily to extensive dental treatment for periods of up to two and a half hours without experiencing undue side reactions or psychological trauma.

Pentobarbital is a short acting barbiturate most commonly administered orally. The barbiturates are central nervous system depressants with which almost any degree of depression from light sedation to deep hypnosis and surgical anesthesia may be obtained through proper selection of drug, dose and route of administration. The effect is manifested within 15 to 30 minutes and lasts three to six hours.

Meperidine is a narcotic whose potency lies between that of codeine and morphine. Action results in from 10 to 20 minutes after injection, with effective analgesia lasting three to four hours.

**Table** *Dosages for premedication*

| Age | Weight (pounds) | Meperidine (mg.) | Scopolamine (mg.) | Grains | Pentobarbital (mg.) |
|---|---|---|---|---|---|
| 1 | 20 | 10 | 0.10 | 1/600 | 15 |
| 2-3 | 25-30 | 10 | 0.15 | 1/400 | 15 |
| 3-4 | 30-35 | 12 | 0.15 | 1/400 | 30 |
| 4-5 | 35-40 | 15 | 0.17 | 1/350 | 30 |
| 5-6 | 40-45 | 18 | 0.17 | 1/350 | 50 |
| 6-8 | 45-55 | 20 | 0.17 | 1/350 | 50 |
| 8-10 | 55-65 | 25 | 0.17 | 1/350 | 60 |
| 10-12 | 65-80 | 35 | 0.20 | 1/300 | 60 |
| 12-14 | 80-110 | 50 | 0.25 | 1/250 | 90 |

The belladonna alkaloids, atropine and scopolamine, are parasympathetic drugs which inhibit secretions, dilate the bronchi, stimulate the respiratory center and protect the heart from adverse vagal stimulation.

In balanced premedication, pentobarbital is used primarily for sedation, meperidine for elevation of pain threshold, and scopolamine for decreasing salivary secretions and producing amnesia.

Most tables of dosages for the aforementioned drugs are for premedication prior to a general anesthetic, and are on the heavy side. The table is merely a guide from which to start until experience is gained in using these drugs.

The child is given a capsule or elixir of pentobarbital orally about 90 minutes prior to treatment; 30 minutes later a subcutaneous injection of combined meperidine and scopolamine is administered. Facilities for the patient to rest after receiving the medications are necessary, but the usual postoperative recovery facilities are not needed. Invariably, the child will be asleep but is aroused on being carried to the dental chair. To minimize all painful stimuli, local anesthesia is used as needed. One to four quadrants may be completed at one sitting. Extractions are best performed at the end of the visit. If difficulty is encountered in keeping the mouth open, a small mouth prop is inserted. Restraints may be used to help limit the child's movements.

Balanced premedication produces a relaxed, sedated and cooperative patient. Usually the child will have no recollection of the experience. This technic is easy to perform. Although side effects are few, idiosyncrasies and allergic reactions could conceivably be the greatest danger. The advantages of this technic over general anesthesia are readily apparent. It is especially indicated for problem management patients, for lengthy pedodontic restorative operations, and for oral surgery.

*Public Health Service, Washington 25, D.C.*

Orthodontics

## A tube attachment for removable orthodontic appliances

J. T. Cook. *Brit.D.J.* 104:168-170
March 4, 1958

A tube attachment was designed to provide a method of joining a labial bow to a modified arrowhead (Adams') crib without welding or soldering the wires, since this may lead to loss of temper of the stainless steel and result in fracture of the crib or bow after the appliance has been in use for some time. The tube attachment also provides a means of replacing labial bows and attached springs so that in some instances one basic orthodontic appliance can be adapted for use in several stages of treatment, thus shortening treatment time, saving surgery and workshop time and materials, and minimizing inconvenience to the patient.

The tube attachment consists of a short length of stainless steel oval tubing which will accommodate two round stainless steel wires—that is, of a crib and a bow. The tube attachment is incorporated in the crib during its construction, and the bow is secured in the tube by a friction stop mesially and by a bend in the bow distally.

The crib is made from 0.7 mm. diameter hard stainless steel wire, the labial bow from 0.8 mm. diameter wire, and the tube from round stainless steel tubing 0.25 mm. internal diameter.

The tubing is softened by being heated to red heat and allowed to cool. It is cut into lengths of about 1 cm. with a carborundum disk; the burred edge inside the tube is removed with a file point. A piece of this tube is threaded onto a length of 0.8 mm. wire and nipped with flat pliers into an oval section. The space remaining in the tube will accommodate 0.7 mm. wire.

To make a crib carrying the attachment, a length of prepared tube is used, slightly shorter than the distance between the points at which the arrowheads will contact the tooth. A short piece (about 1 inch) of 0.8 mm. wire and a length of 0.7 mm. wire sufficient to make the crib are threaded into the tube so that an equal length of wire protrudes at each end. The crib then is made in the usual way (Adams, 1950, 1953). Figure 1 shows the completed crib with the tube attachment and 0.8 mm. wire "keeper," which must be left in place during construction.

When the cribs have been made, the labial bow can be bent to shape, leaving about 1 inch excess at each end which should be tapered

*Figure 1 Completed Adams' crib with tube attachment. Note the 0.8 mm. wire "keeper" which must be left in place during construction of the crib and while the acrylic resin is being processed*

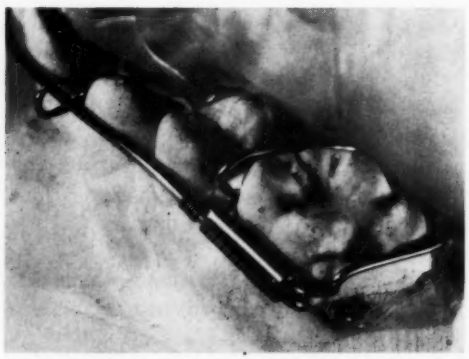

*Figure 2 Method of locking labial bow in tube attachment. A friction stop is placed mesial to the tube, and a right-angled bend is made in the labial bow distal to the tube*

slightly. A friction stop (Johnson, 1952) is made by winding 0.25 mm. hard stainless steel wire tightly around 0.7 mm. wire to form a coil spring. A short length (about 2 mm.) of this spring will be a tight push fit on 0.8 mm. wire—this is the friction stop. One stop is pushed on to each end of the labial bow and moved along until it lies immediately in front of the corresponding tube when the bow is correctly positioned. The labial bow is now ready, but is not attached to the cribs until the plate has been waxed up and processed with the 0.8 mm. "keeper" in the attachment.

If the labial bow is not required in the first stage of treatment but is to be added later, the "keeper" is left in place to prevent food debris from lodging in the attachment. This does not inconvenience the patient if each end of the "keeper" is bent at right angles close to the tube and cut off short. When the labial bow is to be attached, the "keepers" are removed from the cribs and the ends of the bow inserted into the tubes until the friction stops contact their mesial

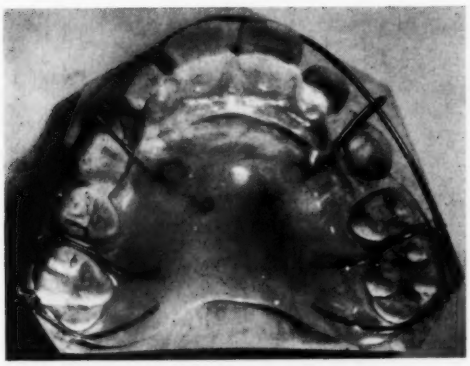

*Figure 3 Appliance used to retract the upper cuspids after extraction of the upper first bicuspids. Palatal finger springs have free ends guided by labial bow which is joined to cribs by tube attachment*

ends. If the stops were positioned correctly, the bow now will fit accurately; otherwise, the stops may be adjusted before the bow is locked in position by bending the distal ends close to the tube and cutting them off short (Fig. 2).

Figure 3 shows the attachment in use on an appliance to retract the cuspids. Palatal finger springs are used, with their free ends guided by a labial bow around which they form free running oval loops. At a subsequent stage of treatment, this bow is replaced on the same appliance by another bow carrying a "strap" spring to retract the incisors; the acrylic plate is cut away from the palatal surfaces of the incisors.

The tube attachment has been used regularly for more than two years, and has proved mechanically sound.

*277, The Broadway, Cullercoats, Northumberland, England*

## Disharmony in tooth size and its relation to the analysis and treatment of malocclusion

Wayne A. Bolton. *Angle Orthodont.* 28:113-130 July 1958

One of the fundamentals with which the orthodontist has to deal in reconstructing the dentition is tooth size; specifically, the mesiodistal width of the teeth. Few investigations have been conducted on this phase of orthodontics. The primary purpose of the present study was to analyze a group of casts of patients with excellent occlusions, and determine whether mathematical ratios could be set up between total lengths of dental arches, as well as between segments of dental arches.

The casts of 55 patients with excellent occlusion were selected and various measurements made on the casts. These included a determination of the mesiodistal diameters of all the individual teeth, certain buccal segment measurements, the degree of overbite and overjet, the angle of the maxillary central incisor to the mandibular central incisor, central incisor lengths, and cusp height. From statistical analyses of the data, the following conclusions were reached.

1. The tooth size data were compared to those published by both Black (1902) and Ballard (1944), and the results of all were found to be closely related.

2. When the 12 maxillary teeth were compared with the 12 mandibular teeth in a ratio as

$$\frac{\text{sum of 12 mandibular teeth} \times 100}{\text{sum of 12 maxillary teeth}} = \text{over-all ratio}$$

a statistically significant mean, standard deviation, and coefficient of variation were found to

exist. They were 91.3 ± 0.26, 1.91, and 2.09 per cent, respectively.

3. When the six maxillary anterior teeth were compared to the six mandibular anterior teeth in a similar ratio as afore-mentioned, equally significant findings were obtained. For a mean of 77.2 ± 0.22, the standard deviation was 1.65 and the coefficient of variation was 2.14 per cent.

4. The maxillary and mandibular buccal segments can be divided so as to give units which can be compared one with another. This procedure can be an aid in localizing tooth size disharmonies which would alter the occlusal relations desired from orthodontic treatment.

5. The degree of overbite had a wide range of variability within this sample of excellent occlusions. The mean was 31.3 per cent with a range of 11.8 per cent to 53.9 per cent. The standard deviation was 10.2 with a coefficient of variation of 32.6 per cent.

6. A significant coefficient of correlation could not be found when the degree of overbite was related to incisor length.

7. A significant coefficient of correlation could not be found when the degree of overbite was related to tooth size, via the anterior ratio.

8. Overbite was related to cusp height by the coefficient of correlation. A +0.28 indicated a poor correlation between these two.

9. Bicuspid relations were studied by analyzing the means of the mesiodistal diameters along with coefficients of correlation. The study emphasized the need for considering bicuspid sizes on an individual basis before the final decision is made when extraction is contemplated.

10. A practical example of the disharmony in occlusal relations that can be caused by increasing tooth width with overcontoured restorations is shown.

11. The statistical evaluation given by Ballard and Wylie (1947) in the study of patients with mixed dentitions was repeated in this investigation, with similar results.

12. The clinical implication of the ratios devised has been demonstrated. It is felt that they can be one of the tools used in orthodontic diagnosis, but should be considered as a preliminary step to the diagnostic setup.

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## Some observations on extraoral treatment

Morse R. Newcomb. *Angle Orthodont.* 28:131-148 July 1958

Soon after the end of World War II S. J. Kloehn expounded the advantages of extraoral treatment for Class II, Division 1 malocclusions. The author, who spent some time in Kloehn's office, initially assumed that extraoral force alone, or with a bite plane, was capable of correcting many Class II, Division 1 malocclusions. This proved to be fallacious. Although correction with extraoral therapy was sometimes gratifying, in many instances treatment had to be completed with more conventional appliances. The author has become more critical in selecting patients for extraoral treatment; the possible need for other appliances invariably is emphasized, and an arbitrary limit of six months on the use of extraoral force has been set.

The effect of extraoral treatment may involve posterior tipping of the maxillary first molars, their bodily posterior movement, or simply a cessation of the usual downward and forward migration that accompanies developmental growth.

The author's case records show only minor permanent alteration of the hard and soft tissues after extraoral treatment. The effectiveness of extraoral treatment for the patient cannot be forecast. Frequently, it is necessary to change to fixed appliances. An excessive amount of time for extraoral treatment is required in some instances. There is a tendency to apply extraoral treatment to too severe malocclusions.

Perhaps the best use of extraoral force is in conjunction with other appliances. Its use can reduce the duration of intermaxillary force in Class II malocclusions, and thereby lessen the resulting anterior movement of mandibular teeth. Extraoral force also can reinforce the effectiveness of intermaxillary elastics.

Extraoral force may be regarded as a useful orthodontic method in selected patients. Given ideal patient cooperation and a satisfactory growth trend, extraoral force may correct the relatively mild Class II, Division 1 malocclusions. It is most useful as an auxiliary with other appliances.

*13110 Shaker Square, Cleveland, Ohio*

Prosthetic dentistry

## Technique for duplicating an acrylic resin denture

C. E. Adam. *J.Pros.Den.*
8:406-410 May 1958

The following technic has been used to produce an accurate duplicate of a complete denture:

The denture to be reproduced is cleaned. If necessary, a new impression is obtained with a zinc oxide-eugenol impression paste, using the denture as a tray. With a no. 5 bur, two holes 10 mm. apart are bored on the lingual and palatal sections of the denture and in the bicuspid area on either side. The holes serve as exit apertures for the excess paste, and as places of attachment for a heavy thread which is used as a handle in withdrawing the impression from the mouth (Fig. 1).

A hard stone cast is poured in the impression thus obtained. After the stone has set, the cast is removed. If undercuts in the vestibular section or elsewhere prevent removal of the denture from the cast, the undercuts are incised by means of a separating disk; prior to their removal, a plaster impression is made of only that portion of the denture where the separation is to occur.

After the cast is shaped, deep notches are cut on either side, and an escape hole 3 mm. in diameter is bored in its center (Fig. 2). The hole permits air and excess wax to escape from the hydrocolloid mold. The denture is replaced in the cast along with the precut sections, if any, and all parts are stuck together with wax. The denture is reshaped and the excess impression paste and the two thread ligatures are removed.

The denture on the cast is transferred and lightly secured with wax to the base of the duplicating flask, and hydrocolloid is poured around it in accordance with the usual duplicating method.

After the hydrocolloid cools and sets, the cast and the denture are taken out of the hydrocolloid, and the denture is removed from the cast.

*Figure 1 The denture prepared for a relining impression, with a heavy thread looped through holes drilled in the palate*

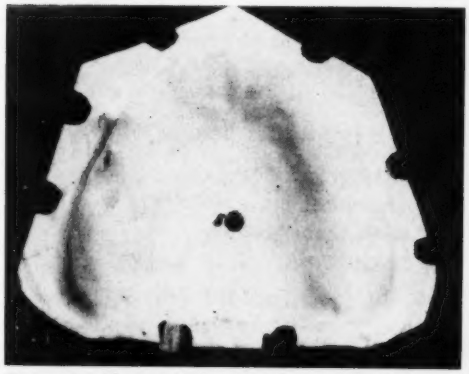

*Figure 2 The notched cast with an escape hole provided in the palate. The hole permits air and excess wax to escape at the time the cast is placed back in the mold*

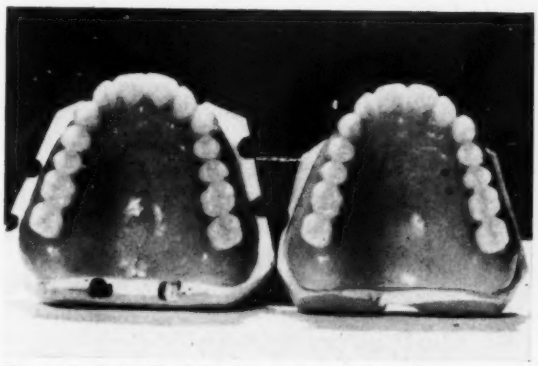

*Figure 3 Left, the duplicate, and right, the original denture*

The cast and the hydrocolloid mold are placed in water at 40° to 45° C. and allowed to remain there.

A quantity of ordinary laboratory wax of a red or rosy color is melted in a hot water bath and maintained at a temperature of 65° to 70° C.

The hydrocolloid mold is removed from the warm water and air-dried. Then the wax is poured into the hydrocolloid mold, and the cast is placed in the duplicating flask immediately, care being taken to place it properly into the grooves in the mold. The cover of the duplicating flask is adjusted, and light pressure is applied. After six hours, the flask is opened and the first duplicate denture is obtained. The wax replica obtained is placed in the usual flask, and the denture is completed in the usual manner. The duplicate thus obtained differs in no way from the original denture (Fig. 3).

*Solonos 13, Athens, Greece*

### Dimensional stability of rubber base impressions and certain other factors affecting accuracy

Richard J. Schnell and Ralph W. Phillips. *J.A.D.A.* 57:39-48 July 1958

Five brands of rubber base impression materials—Coe-Flex, Form-Flex, Permlastic, heavy body Permlastic, and Sta-Tic—were studied to determine their dimensional stability on storage and the effect of certain other variables which influence their accuracy. Over 700 impressions were studied. A Bureau of Standards steel die and a series of four multiple-cavity preparations were used. The following conclusions were reached:

1. None of the rubber base materials tested was dimensionally stable. The distortion probably can be associated with continued curing of the material. Distortion, however, at any time interval was less than with reversible hydrocolloid.

2. Distortion was not significantly affected by the storage environment. Storage in water should not be employed when a plastic tray or shell is used.

3. Use of the double mix procedure increases the initial accuracy of the impression and reduces the distortion during storage.

4. When a band impression is taken with a single mix of material, accuracy decreases as the thickness of the surrounding rubber base is increased.

5. The bulk of the material is less critical when the double mix technic is used.

6. Bubbles in the impression are minimized by the use of a syringe and double mix procedure.

7. Uneven distribution of impression material around the tooth increases distortion.

8. Successive dies may be poured in one impression with no greater distortion than storage of the unpoured impression for a comparable period.

9. When the brands tested were used properly, little difference was detected in their accuracy. Selection probably will be based on handling characteristics.

10. For indirect technics involving single or multiple preparations and short-span bridges, the rubber base impression materials are comparable in accuracy to the better reversible hydrocolloids. Long-span or complex bridges were not studied, but no reason is known to contraindicate the use of this type of material in such instances.

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### Inflammation of tonsils caused by a mishap in dental practice

R. Roy. *Rev.franç.odont.* 3:1169-1170 Nov. 1956

The patient, a 30 year old woman, received a fixed bridge in which four tooth abutments (vital cuspids and bicuspids) had been used. The abutment teeth were prepared with diamond burs.

During the preparation of the abutments, the dental assistant had directed a cold air current toward the oral region involved in the procedure.

The customary direct impressions had been taken with copper rings and Kerr's impression compound of both jaws.

The patient did not appear for the next appointment. The dentist was informed that she was confined to bed with a temperature of 40°C. (104°F.). The physician diagnosed her condition as severe tonsilitis, and prescribed gargles, Priessnitz compresses, and, when the temperature did not subside, antibiotic treatment.

After 14 days, although her condition was not improved, the patient appeared at the office for continued dental treatment mainly because she had difficulty in masticating.

The dentist consulted an otolaryngologist whose examination of the patient's oral cavity

and respiratory system revealed an inflammation of the tonsils and lesions in the throat, larynx and pharynx which contained decomposed cells, bacteria and pus. The tonsils were covered with a dark coating.

Microscopic and histologic examinations disclosed that the coating of the tonsils consisted of powdered amalgam which had been blown into the respiratory tract by the cold air current used during preparation of abutments. In the larynx, minute parts of gypsum plaster were found.

Disinfection and elimination of the infectious material in the oral cavity and respiratory tract obtained the desired cure.

Precautions should always be taken to avoid accidents of such kind in dental practice.

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### "Aurodin," a new dental gold alloy

Hans Diana. *Zahntechniker* 24:1-4 June 1958

For dentists and patients, the most important consideration in regard to the structural formula of the dental alloy to be employed is that it contains a sufficient amount of precious metal (gold and platinum) to insure that inserted restorations will not discolor in the mouth.

The almost ideal dental alloy, therefore, is gold-platinum, especially if soldering is to be carried out. Because of the high cost of platinum, the place of gold-platinum among the precious dental alloys has been taken over, at least to a certain degree, by less expensive alloys such as chrome-cobalt, gold-silver, gold-palladium, gold-nickel and gold-zinc alloys. Most of these dental alloys, however, have definite disadvantages in the processes of melting, casting and soldering.

"Aurodin," a gold-platinum-indium-cobalt alloy, produced in Switzerland, has been recently introduced to dentistry. This alloy costs about 25 per cent less than gold-platinum, but under standard conditions obtains a refinement in the grain structure of the casting which is almost identical with that of the higher priced alloys. Aurodin has proved to be equal in hardness, strength and durability, and superior in elasticity. It is extremely resistant to corrosion, lighter than most dental alloys, and is, therefore, more suitable for construction of dentures, particularly of complete lower dentures.

Too much hardening heat-treatment or precipitation hardening may produce brittleness. Too low a temperature and too short a heat treatment will leave the casting soft, and clasps or other comparatively thin parts will be distorted during use.

Aurodin, with a Brinell hardness number above 130, consists of 65 per cent gold, 4 per cent platinum, 5 per cent indium and 26 per cent cobalt. Its melting point is 815° C.

Aurodin dentures cause less damage to the remaining natural teeth and gingival tissue than acrylic dentures. This is particularly noticeable in instances of partial (skeleton) dentures and bridges which cover only a small area of the soft tissues.

Aurodin can also be used in a subperiosteal implant. Dentures made of this alloy need not be as thick as those made of gold or gold-platinum. Since its specific gravity is lower than that of most other dental alloys, an Aurodin denture is comparatively light in weight. This is a distinct advantage for complete upper dentures, where the force of gravity must be resisted by retention.

When an Aurodin denture is carefully and accurately designed and constructed, the difficulties encountered in finishing and adjusting are reduced.

Aurodin has proved to be satisfactory in resistance to corrosion and discoloration, and remains untarnished even in instances when the oral hygiene is not all that it might be.

Every dentist should be qualified to select the proper dental alloy for his restorative work. He should be able to decide what demand will be made on the denture under service conditions, and to determine what dental alloy possesses the properties necessary to fulfill the requirements. Use of Aurodin, however, enables the dentist to avoid any compromise in design or type of denture because of the superior quality and certainty as to the physical properties of this unique dental alloy.

*Neuchâtel, Switzerland*

Oral surgery

**Severe protrusion of the mandible: surgical correction**

John B. Erich. *Proc.Mayo Clin.* 33:331-336 June 11, 1958

Operations to correct mandibular prognathism may be divided into two categories; namely, those performed on the rami and those on the body of the mandible. Bilateral resection of a segment of bone from the body of the mandible with preservation of the inferior alveolar nerve and artery is the simplest and most uniformly effective means of correcting mandibular prognathism. This technic divides the lower jaw into three fragments. When the anterior fragment is forced backward to proximate the two posterior segments, the deformity is corrected. Bilateral ostectomy does not disturb the temporomandibular joints or muscle attachments to the rami and never produces an open bite or any degree of fibrous ankylosis. The only disadvantage is the necessary shortening of the mandibular arch and this appears to be of minor importance in view of the fact that the patient is able to incise and masticate food properly.

In recent years the author has found it advantageous to divide the method into three stages, each performed with the patient under local anesthesia.

Preoperatively, dental impressions of the upper and lower dental arches are secured, plaster study models prepared and lateral roentgenograms obtained.

The first stage, as outlined by Dingman (1948), involves the extraction of all teeth in the two portions of bone that eventually are to be removed. In addition, a dental bur or motor-driven saw is employed to make two parallel cuts on each side of the mandible from the alveolar process down close to the mandibular canal (Fig. 1, left). The bone between these cuts corresponds in width to the segment of bone to be resected. When the intraoral wounds made by the extraction of teeth and the saw cuts have healed—usually a matter of three or four weeks—the second stage is undertaken.

Before the second stage, however, intraoral appliances are inserted and attached to the teeth for ultimate fixation of the bony fragments. Hooked arch bars with intermaxillary elastic bands provide the ideal method of immobilization (Fig. 1, right). A hooked arch bar is ligated to the maxillary teeth. A small piece of a hooked arch bar is ligated by wires to the teeth that will remain in the mandibular anterior fragment. If a molar will remain intact in either or both posterior fragments, orthodontic anchor clamp bands are applied to such molars.

An incision 4 to 5 cm. long is made in the submaxillary region about 2 cm. below the lower border of the mandible. Through this incision, the body of the mandible is exposed by blunt dissection. The periosteum is reflected from the buccal and lingual surfaces and the upper edge of the bone with elevators, to expose the full circumference of the mandible where the segment of bone is to be removed. The saw cuts previously made are readily visible. Two parallel lines are drawn with an indelible pencil on the external surface of the mandible to connect with the saw cuts. A motor-driven circular saw is employed to cut along each of these pencil lines from the lower border of the mandible upward almost to the level of the mandibular canal (Fig. 2,a). A chisel is placed between the upper extremities of the two lower saw cuts (lower part of mandible); by firm tapping of the chisel with a mallet, the intervening portion of bone is removed (Fig. 2,b). The chisel then is placed between the upper saw cuts (made several weeks earlier), and the piece of bone between these two saw cuts is detached. The remnant of bone remaining about the nerve and vessels is gradually nibbled away with small rongeur forceps. A curet is used to remove some of the cancellous bone surrounding the nerve and vessels in each segment. A cavity is thus created in which the exposed nerve and vessels can rest without injury when the anterior and posterior segments are brought into apposition.

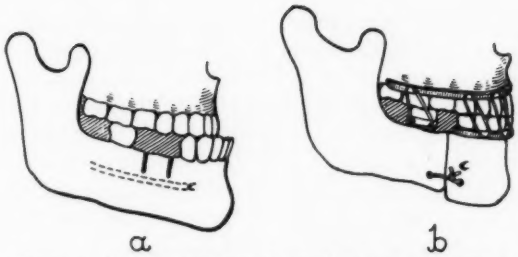


*Figure 1* (*a*) *In first stage the teeth of each segment of bone to be removed are extracted, and two cuts are made with a motor-driven circular saw from the alveolar border down toward the mandibular canal.* (*b*) *The second and third stages have been performed. Appliances for dental fixation are in place. Segments of the mandible have been removed, and the fragments are held together with heavy chromic catgut*

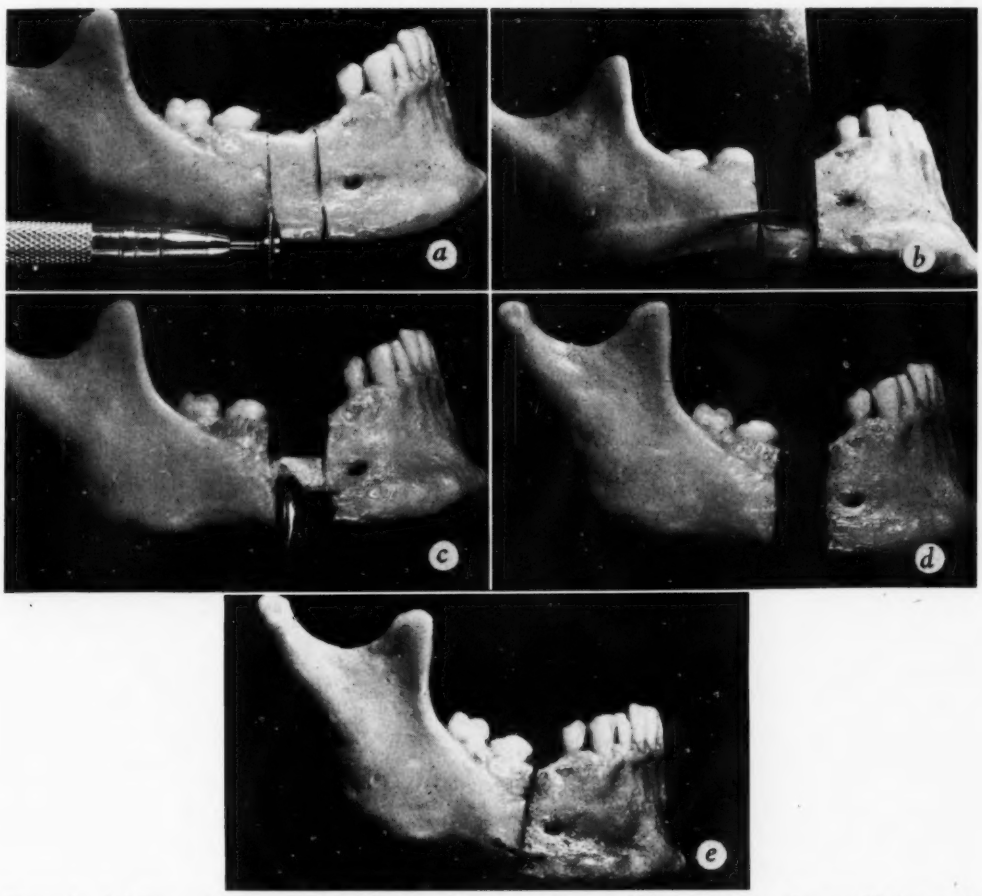


*Figure 2* (*a*) *Saw cuts are made from the lower border of the mandible up close to the mandibular canal.* (*b*) *Chisel removes intervening bone.* (*c*) *Chisel removes bone between upper cuts made several weeks earlier.* (*d*) *Segment of bone removed without injuring nerve.* (*e*) *Anterior fragment is moved back into apposition with posterior segment; fragments are held together with catgut or tantalum wire*

A small hole is drilled in each fragment near the lower border of the mandible, about 1 cm. from the cut edge. If a tooth is present in the posterior fragment for fixation, heavy chromic catgut is placed between the two holes to approximate and hold the fragments together. If there is no tooth, heavy tantalum wire is used for this purpose. When the anterior and posterior fragments can be immobilized by interdental fixation, the bony fragments should be held together only with catgut, which gradually is absorbed.

The third stage of the operation is performed two or three days later. This involves removal of the segment of bone on the opposite side of the mandible, and the technic is identical to that described in the second stage. As soon as this stage is completed, the elastic bands are applied to the intraoral appliances. By constant traction, these rubber bands tend to pull the lower teeth into satisfactory occlusion. The rubber bands can be left in place for from four to five weeks. The three fragments of the mandible usually heal satisfactorily in five weeks. After removal of all intraoral devices, the dental occlusion often can be improved by grinding down cusps of teeth that interfere with good articulation.

*Mayo Clinic, Rochester, Minn.*

## Clinical evaluation of erythromycin dental cones in oral surgery

Walter Raymond Mourfield, Jr., and John Mallett Barron. *Oral Surg., Oral Med.& Oral Path.* 11:584-586 June 1958

A controlled clinical investigation of the use of erythromycin dental cones was carried out at the University of Tennessee College of Dentistry. Within an investigation period of four months, 1,471 teeth were extracted in 557 patients. Erythromycin dental cones were placed in the alveoli after 917 of the 1,471 extractions, and were not placed after 554 of the extractions. Within a control period of four months, 902 teeth were extracted in 653 patients.

The use of erythromycin dental cones in the extraction wound reduced the incidence of osteoalveolitis or postextraction cellulitis to 1.18 per cent in 917 extractions, as compared to 13.30 per cent in 902 extractions in the control period. Thus, the incidence of postextraction infection for the control period was 12.12 per cent greater than for a like number of extraction wounds treated with erythromycin dental cones during the investigation period.

No indication of a local tissue reaction or generalized allergic response to erythromycin was observed. Healing was normal in the presence of the erythromycin dental cone except for rare instances of hypersensitivity reaction to erythromycin.

*College of Dentistry, University of Tennessee, Memphis, Tenn.*

## Histopathological study on significance of perforation treatment in experimental mandibular osteomyelitis

Kyuji Kato. *Bul.Oral Path.,Tokyo* 2:19-64 Nov. 1957

Of all the bones in the body, the mandible is the most frequent target of suppurative osteomyelitis. No completely satisfactory method has yet been found for treatment of osteomyelitis by perforation of the jaw. Since the traditional method of perforation has many weaknesses, a new method was devised by the author. The effects of the two methods were compared histopathologically.

Acute suppurative mandibular osteomyelitis was produced in 56 dogs by the method of Suzuki, Kitamura and Morita (1954). Kato's method (perforation of the bone marrow from the outside of the mandibular bone below the roots of each of the two causative teeth with a bur 1.5 mm. in diameter) was applied to 20 dogs. In this instance the causative teeth were the first and fourth premolars. In another group of 20 dogs, Yumikura's method of perforation with a round bur 3 mm. in diameter was used at the usual spot beneath the mental foramen. Half of the dogs treated by Kato's method and half of those treated by Yumikura's method received the treatment 24 hours after infection. Treatment in the other dogs was started seven days after infection. The remaining 16 dogs received no treatment and served as controls. The healing processes of the two methods of treatment were

studied histopathologically at various stages from 1 to 14 days after treatment, and the results were compared.

Generally, for two days after perforation, the inflammation in the dogs treated by Kato's method was slightly more severe than in the untreated controls. This more severe inflammation was considered to be due to the mechanical stimulation received by the mandibular tissues during the operation. On the third day after the operation, however, reduction of the inflammation was noticeable, and the inflammation never returned throughout the healing process. Because of destruction by perforation, the foci in the causative teeth became slightly enlarged, but they began to localize on the third day after the operation; with proliferation of the surrounding tissues, the foci became perfectly and rapidly localized. Closing of the perforation wounds was slow; hardly any wounds closed as long as the inflammatory foci remained in adjacent tissues. Healing progressed better in the dogs treated 24 hours after infection than in those treated seven days after infection.

In the dogs treated by Yumikura's method, generally, for one or two days after perforation, inflammation was more severe and more extensive than in the untreated controls. On the third day, however, the inflammation began to diminish. Even though severely inflamed foci remained in the two causative teeth, the perforation wound was almost closed on the seventh day after perforation. Incidental disease due to perforation was observed frequently. In some instances, such disease completely destroyed the structure of the mandibular canal, producing a situation that would likely result in abscess.

It was concluded that perforation is extremely effective in healing the inflammation of acute suppurative mandibular osteomyelitis, especially when the inflammation is at the acute stage. The location of the perforation determines the extent of healing. The perforation should be made in the coarse alveolar bone near the apex of the causative tooth. The perforation should not be in the healthy part of the mandible but at the region of primary focus. In instances such as those in this experiment, in which there are two primary foci, perforations should be made at each. Perforation should not be made at the mandibular canal, at the causative and neighboring teeth, or at the compact bone of the alveolar septum near the necks of the teeth. The effect of drainage from the perforative wound in both methods is remarkable. The perforation should be no larger than necessary; one of 1.5 mm. in diameter is suitable. Perforation alone cannot get rid of the focus of inflammation at the causative tooth. Therefore, perforation is not a decisive treatment of this disease. It is necessary either to extract the causative tooth, to extirpate the sequestered bone or to treat the causative tooth at the proper time.

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### Precautions in biopsy technique

H. H. Scofield. *Mil.Med.* 122:390-394 June 1958

The dentist is in a strategic position to recognize early precancerous lesions of the lips, mouth and oropharynx. The diagnosis of advanced cancer usually can be made by the experienced clinician without the aid of microscopic study. In its early stage, however, a malignant lesion may appear innocuous or may simulate other disease processes. The biopsy is the single most conclusive method of confirming or establishing the presence of malignant disease.

Biopsy is the removal of a portion of tissue from a patient for the purpose of microscopic examination and diagnosis. When properly performed it is without serious consequence to the patient. However, certain precautions must be observed by the clinician who undertakes the procedure to assure that he will receive maximum assistance from the pathologist.

Surgical excision with the scalpel is the method of choice when obtaining a biopsy specimen from the oral region. A specimen so obtained usually is the cleanest, least distorted, and most easily diagnosed. Surgical excision may be partial or complete, depending on the size, location and character of the lesion. Small, superficial, easily accessible lesions, pigmented moles, vascular lesions and encapsulated tumors never should be cut into but should be removed in their entirety. In a partial biopsy, the specimen should be obtained from the margin of the lesion, care being taken to include a portion of the adjacent normal

tissue. A wedge-shaped piece of tissue about 1.0 cm. long, 0.5 cm. wide and 1.0 cm. deep usually will provide the pathologist with an adequate specimen.

Deeply colored surface antiseptics, such as thimerosal or iodine, should not be used to cleanse the biopsy site since they may interfere with the subsequent staining of the tissue. Seventy per cent alcohol is the antiseptic of choice.

The anesthetic agent of choice is procaine hydrochloride or lidocaine hydrochloride. The anesthetic agent should be injected about the margins of the lesion, never into the lesion proper lest it distort the tissue.

Care must be observed when removing the specimen to avoid squeezing or distorting the tissue. The specimen should be grasped firmly at its normal tissue end with small, mouse-toothed forceps and gently lifted out. It may be freed from its base by careful snipping with a small, pointed scissors. The specimen should be placed immediately in 10 per cent Formalin (4 per cent formaldehyde) after being rinsed in cold water. This should be done even before the wound is closed. The specimen should be submitted to the pathologist with a detailed clinical description and history of the lesion.

A negative report from the pathologist never should be accepted as final in the presence of persistent clinical evidence of malignancy.

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### Trigeminal neuralgia

*Brit.M.J.* No. 5088:117-118 July 12, 1958

Q.—What is the treatment of trigeminal neuralgia?

A.—Trigeminal neuralgia is characterized by sudden stabs of lancinating pain which "paralyze" the patient while they last, and which are referred to the distribution of the trigeminal nerve only. A similar pain may develop in association with disease of the teeth, the gingivae, the temporomandibular joint (Costen's syndrome), or tumors of the gasserian ganglion, and can be relieved by attention to the local lesion.

When local abnormalities have been excluded, relief of pain often becomes the first consideration. Severe instances can be relieved only by blocking the branches of the nerve concerned, and this is generally by far the most useful measure. Usually the nerve must be blocked by alcohol or sectioned by a surgeon, but there is much to be said for repeated procaine blocks in less severe instances of the disease. Such local analgesia may be followed by relief of pain for several days, or even weeks, and it may be repeated as often as desired. This procedure also produces the numbness which the patient will have to tolerate if the nerve is cut, and permits him to appreciate what to expect. Simpler methods include frequent self-administered massage or galvanism to the sensitive areas when the pain is absent. Drugs are of limited value, but in some mild instances of the disease the patient seems to benefit from large doses of vitamin $B_{12}$ or vitamin $B_1$.

*British Medical Association, Tavistock Square, London W.C.1, England*

### Pathogenesis and treatment of traumatic shock

A. Jacobsen. *Tskr.norske laegefor.* 78:269-274 April 1, 1958

Traumatic shock may occur after any surgical procedure. It may become manifest immediately or several hours after the operation and is characterized by an acute and progressive circulatory failure which, if sufficiently grave and not treated, can lead to death.

The peripheral circulatory failure, due to a general reduction in the volume of the circulating blood, causes a tissue anoxia affecting most or all of the metabolic processes. The response of the organism to the sudden reduction of blood volume is a general vascular contraction in the arterioles. This reaction may compensate for the loss of blood of up to 30 per cent and provides for the organism the time required to draw fluids from the extracellular spaces. If, however, the blood volume is reduced further, the vascular contraction becomes insufficient to prevent atony of the smooth muscles of the arterioles. Peripheral resistance and arterial pressure drop and the vital organs no longer receive an adequate blood supply.

Treatment of traumatic shock, usually as an emergency procedure, should be known to every

surgeon and dentist. Rapid diagnosis and evaluation of the degree of shock present are important. Heavy bleeding must be controlled by compression bandages. Although traumatic shock is rarely seen in dental practice, a related type, neurogenic shock, either primary or secondary, may occur after multiple extractions or oral surgery. It is diagnosed by its rapid onset with simultaneous low blood pressure, slow pulse and fainting.

The patient must be placed in a horizontal position with his feet elevated. If the hypotension lasts for more than 10 to 15 minutes, the same treatment procedures are applied as in traumatic shock. Although traumatic shock usually develops slower than neurogenic shock, if hemorrhage from the larger vessels occurs, the symptoms and effects are identical.

In both instances it is important to explain the situation to the patient, to give him confidence and a feeling of security. Small doses of morphine are given intravenously or intramuscularly to alleviate pain, and a short-acting barbiturate is administered intravenously in restless patients.

Because loss of blood is the direct cause, and the degree of the loss is directly proportional to the degree of the postoperative (traumatic or neurogenic) shock, a clinical estimate of the approximate blood loss should be made immediately.

Primary treatment consists of replacement of the lost blood volume. Whole blood is the best substitution fluid.

Routine use of vasoconstrictors or thromboplastic agents after extractions or oral surgery is unnecessary, and, in some instances, even contraindicated. Bleeding of surgical or traumatic origin, causing shock, may be controlled sufficiently by application of direct pressure to the site of the wound. Prolonged bleeding, after periodontal surgery, may be checked by application of a dressing wetted with phenylephrine solution (1 per cent). These measures are necessary adjuncts but are secondary to replacement of the lost blood volume.

*Nørregade 6, Copenhagen, Denmark*

**Carcinoma of the lip, tongue and floor of the mouth**

Giovanni Balduzzi. *Arch.ital.chir.* 82:81-89 Aug. 1957

Carcinomas of the lip, the tongue and the floor of the mouth usually are malignant epithelial tumors in which the cells show an atypical arrangement with varying degrees of differentiation.

Twenty-three case reports out of the author's personal experience are presented. In all instances, extirpative surgery and not roentgenotherapy was the method of choice. Carcinoma of the lip was treated by prompt local excision. In most instances, preventive neck dissection was not indicated because the supramyoid dissection was sufficient. A "cure rate" of about 55 per cent was obtained.

Carcinoma of the lip frequently was accompanied by bilateral neck metastases. In these instances, a combination of electrosurgery and roentgenotherapy produced the best results.

In comparatively small carcinomatous lesions of the anterior part of the tongue, simple cautery excision and postoperative roentgenotherapy were used. In more extensive carcinomatous lesions a combination of hemiglossectomy, cervical lymphadenectomy and roentgenotherapy was utilized. Carcinomas situated at the base of the tongue were treated by bilateral neck dissection and ligation of the lingual arteries. After ten days, excision of the primary lesion was carried out by electrosurgery.

Carcinoma of the floor of the mouth, usually accompanied by metastases, was treated by radical excision and bilateral neck dissection. In most instances, roentgenotherapy was utilized as an adjunct to surgery.

The author's method of radical neck dissection consists mainly of the reflection of the platysma muscle with skin flaps, sparing of the sternocleidomastoid muscle and the resection of the internal jugular vein. The bilateral resection of the internal jugular vein presents no significant difficulties to the experienced oral surgeon.

*Via Farini 6, Bologna, Italy*

Public health dentistry

### You and your toothbrush

*Du Pont Mag.* 52:5-7 June-July 1958

A study of the toothbrushes used by members of 1,000 families in the United States has been sponsored by E. I. du Pont de Nemours & Co., in cooperation with the American Dental Association. Families were asked to send toothbrushes they were using to Robert G. Kesel, of the University of Illinois College of Dentistry. A tag questionnaire was to be filled in and attached to each brush. A new toothbrush was sent for each used brush turned in.

Of the 2,032 brushes received, 700 were judged to be in usable condition, 1,219 were in unusable condition, and 90 were "doubtful." Twenty-three brushes were not toothbrushes but were designed to clean dentures, vegetables, and so forth.

The largest percentage of unusable brushes was found in the age group between 46 and 50 years, and the next largest in the age group between one and five years. The largest percentage of usable brushes was found in the age group between 11 and 15 years, followed by the age group between 26 and 30 years. Unusable toothbrushes predominated in every five-year age group except that between 11 and 15 years old, for which 63 per cent of the toothbrushes were usable.

The oldest usable brush sent in had been in use for five years. Another usable brush was three years old, but 89 per cent of the usable brushes had been used for a year or less. Nearly 80 per cent of the unusable brushes had been in service for one year or less. Apparently, the method and frequency of toothbrushing are important in determining the effective life of a toothbrush.

The average age of usable toothbrushes was 8.2 months, and the average age of unusable toothbrushes was 12 months. One respondent reported that his toothbrush had been in use for 13 years; it was rated unusable.

About half of the respondents reported they brushed their teeth twice a day; 29 per cent reported once a day, and 15 per cent, three times a day. Five people (all using overworn brushes) reported they brushed their teeth six times a day.

The results coincided rather closely with those of a similar survey reported by Wisan and Gruebbel (1948). The percentage of unusable toothbrushes has dropped from four-fifths to two-thirds in the past decade.

The times favored for toothbrushing have changed a little. A few more people now brush their teeth before bedtime than did so a decade ago. Fewer brush them before breakfast (36 per cent, compared with 49 per cent reported by Wisan and Gruebbel), and more brush them after breakfast (54 per cent compared with 34 per cent). There has been a slight drop in those who report they brush their teeth after lunch.

Almost exactly two-thirds of the consumer panel (the respondents in the 1,000 families) reported that their parents taught them how to brush their teeth, whereas 17 per cent said they had been taught by dentists. Another 10 per cent said they learned from their teachers.

*E. I. du Pont de Nemours & Company, Wilmington, Del.*

### Mouth protection in contact sports: a survey, evaluation, and simplified method of fabrication

William D. Heintz. *J.Ohio D.A.* 32:64-71 Spring 1958

Mouth guards provide almost 100 per cent protection to the teeth in contact sports. Only two injuries occurred to 579 protected football players of 13 Ohio high schools during the 1957 season. A survey of 18 colleges (including nine from the Big Ten) revealed that all had at least some football players using mouth guards. One of the teams reported that 75 per cent of its players wore mouth guards; this same team will require all players to wear both face guards and mouth guards this fall.

In a previous article (*Journal of the Ohio Dental Association* 30:192-197 Autumn 1956, and

*Dental Abstracts* 2:405-406 July 1957), a procedure for making a self-curing latex mouth guard was presented. Further experimentation has shown that the addition of rayon flock to the material provides a firmer protector that is tougher and that fits better.

Both the liquid latex and the rayon flock are available from the Plastic Arts Studio, 3403 South Madison Street, Muncie, Ind.

A complete upper arch impression is taken in any elastic impression material and a cast constructed, air dried for at least two hours and the region to be covered is outlined on the cast.

The material for the guard is a mixture of liquid latex and flock, made by mixing two-thirds by volume of latex and one-third of flock. The latex is poured first in a glass container and the flock is added. The materials are mixed by stirring. Four layers of the material are applied to the cast to form the mouth protector.

A few players will chew through any type of mouth protector. An easy solution is to make another protector; the casts may be used over and over. Or, a tougher biting surface may be provided by incorporating a layer of latex rubber sheeting over the occlusal surfaces of the posterior teeth and the lingual surfaces of the anterior teeth.

The first two layers of latex and flock are applied as usual, but only enough material is applied over the occlusal surfaces of the posterior teeth and the lingual surfaces of the anterior teeth to make them flat. A piece of rubber sheeting 1/16 inch thick is cut in the shape of a horseshoe, only wide enough and long enough to cover the occlusal surfaces of the posterior teeth and continue along the lingual surfaces of the anterior teeth. The underside of the sheeting is buffed or roughened, and a groove is cut in the edges of the sheeting all the way around, using a "separating disk" for this purpose. These two steps provide a "fresh" surface for the liquid latex to adhere to.

The third layer of latex and flock is applied, but only to the occlusal and lingual surfaces that are to be covered with the sheeting. A thin layer of latex and flock is applied on the underside of the sheeting, the latex is allowed to become tacky and the piece of rubber sheeting is stuck in place and the third layer completed, but the rubber sheeting is not covered. The fourth layer is applied in the same way and the mouth guard is completed. The cast is soaked to remove the mouth guard.

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## Caries susceptibility test for patient education

Myra J. Petrie. *D.Asst.* 27:8-9 July-Aug. 1958

Caries susceptibility tests are only indicators, but they can be utilized effectively to educate the dental patient. One of the caries susceptibility tests is the Snyder colorimetric test. Caries susceptibility is indicated by the color change during the period of incubation. The color of the culture medium changes from dark green progressively to yellow-orange in positive instances of caries susceptibility.

The test is particularly suitable for use in the dental office. The necessary equipment consists of a specimen bottle, a graduated pipet, Snyder medium (which may be obtained from any biological firm) and a small incubator box which may be constructed at a cost of less than $10.

The patient is given a sterile specimen bottle and asked to collect a salivary specimen on awakening in the morning, before eating his breakfast or brushing his teeth. The specimen should be collected on the day of the patient's dental appointment, and accepted from him on his arrival at the office. A test tube of Snyder's medium is heated in hot water until the medium liquefies; 0.2 cc. of the salivary specimen is introduced into the test tube which is restoppered, labeled with the name of the patient and the date, and placed in the incubator.

The test tube should be inspected every 24 hours to note any change in color. Patients whose saliva changes the color of the culture medium from dark green to yellow-orange in the first 24 hours of incubation are judged to be highly susceptible to caries; patients whose saliva results in little change in the color of the culture medium after 72 hours of incubation are judged to be resistant to caries.

If a positive reaction to the patient's saliva is obtained, the suggestion is made to the patient

or to his parents that the amounts of sugars, candies and other foods rich in carbohydrates be controlled strictly. If a dietary program is initiated, Snyder tests are repeated every four to six months. If the patient maintains a strict dietary discipline for the first three weeks, a natural tendency to refrain from excessive sweets becomes manifest.

The Snyder colorimetric test is well designed for public health teaching and with modifications may be adapted to the needs of a local school district.

*418 Centennial Avenue, Sewickley, Pa.*

### Studies on the lactic acid production in water-saliva-plaque mixtures

Guttorm Toverud and Arne R. Hagen. *Norske Tannlaegeforen.Tid.* 67:151-165 April 1957

A procedure—a modification of the method of Barker and Summerson (1941)—has been developed for determining lactic acid concentration in 200 cc. aqueous mixtures of saliva and plaque after test subjects have consumed various food substances. Preliminary studies suggest that the procedure may be of value in determining the relative acidogenic potentiality of different foodstuffs and consequently their expected cariogenic potentiality. Substances with a high sugar content are shown to be the most potent sources of acid in the oral cavity.

Apparently there is no significant difference in acid production between small groups of caries-active and caries-inactive children when the arithmetic means are compared. However, the caries-inactive group has a significantly higher variability than the caries-active group. The caries-inactive group can be divided into two subgroups, one of which is characterized by a uniformly low rate of acid production. Thus, the immunity to caries of the individuals in this subgroup apparently is related to the fact that only small amounts of acid are formed.

In the other subgroup of the caries-inactive group, however, the acid production is high, sometimes even higher than in the caries-active group, in spite of the small number of carious lesions present. This discrepancy between laboratory and clinical findings may be explained partly by factors such as the buffer capacity of saliva, the composition of the teeth, and the minimal consumption of foodstuffs containing sugar. These factors were not investigated in the present studies.

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### The carbohydrate constituents of human saliva

Ingemar Berggård and Ivar Werner. *Acta odont. scandinav.* 16:44-50 May 1958 [in English]

Although several theories on the possible role of the saliva in the development of dental caries have been advanced, such theories are based on vague assumptions. Little is known about the carbohydrate components of saliva, and still less about its possible fermentation or degradation in the oral cavity.

An investigation was undertaken to obtain information on the carbohydrate components of human saliva. Saliva was collected individually from eight persons, apparently healthy although all showed moderate dental caries. From seven of the eight, the mixed salivary secretion was collected. From the eighth person, only the secretion emerging from the sublingual salivary papillae was collected.

Normal human saliva contains two main kinds of glycoproteins. One is a neutral glycoprotein, a fucomucin containing hexosamine, galactose and fucose; it is of the same type as the blood group substances found in all epithelial mucous secretions of the body. The other is an acid glycoprotein, a sialomucin containing hexosamine and sialic acid. This type also is found in most epithelial mucous secretions.

In mixed salivary secretion the fucomucin is predominant. The secretion from the submaxillary and sublingual glands is richer in sialoprotein than the mixed salivary secretion.

As sialic acid is a relatively strong acid, it might, if liberated in the oral cavity, possibly have an influence on the development of dental caries.

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## Fluoridation at the Salem and Beverly water works

Homer L. Ash. *Massachusetts D.Soc.J.* 7:17-19 July 1958

The Salem-Beverly water works supplies fluoridated water to the neighboring cities of Salem and Beverly, Mass. (combined population, 71,549). The major source of water is Wenham Lake, with additional supplies from Longham Reservoir, Putnamville Reservoir in Danvers, and the spring and winter runoff from the Ipswich River.

Various chemicals are added to the water before it is ready for consumption. Many people would be amazed if they knew the extent to which man must tamper with "God's Water" to make it safe for human consumption. Before the water is pumped into the station, the lake may be treated with copper sulfate to kill odor-producing algae. The water, on entering the main building, is treated with charcoal and alum to remove obnoxious colors and odors. The addition of alum causes a flocculation which is aided by the natural settling of the water in large basins. Fifty per cent of the flocculate is removed by settling and the remainder is removed by filtration through sand filters. Before filtration, hydrated lime is added to the water to bring the pH back to neutrality from acid conditions. Gaseous chlorine also is introduced before filtration, to inhibit the growth of algae and other organisms on the filter. After filtration, fluoride is added in the form of sodium silicofluoride. At this time, sodium hexametaphosphate or another rust inhibitor also is added.

As the water has a natural concentration of 0.1 to 0.2 ppm fluoride, enough sodium silicofluoride is added to bring the fluoride concentration to 1.0 ppm.

The initial equipment and the building of a separate partition for the storage of the fluoride cost $2,708 in 1952. An electronic control cost an additional $1,760, so that the initial cost of the fluoridation equipment was $4,468. The plant obtains sodium silicofluoride at a cost of 7.75 cents a pound. If the cost of the sodium silicofluoride were 9.0 cents a pound, the daily cost would be $7.80 and the annual cost would be about $3,000, which would amount to 4.2 cents per capita per year for the chemicals. Maintenance is not figured into this cost, as the employees of the water works perform this with no additional help or salary boost.

The sodium silicofluoride is introduced through a feeder into the filtered water which is on its way to an underground reservoir with a capacity of 4,000,000 gallons. The feeder has a gravimetric storage hopper mounted on scales. It is inspected once each hour. This is done by checking the loss of weight of fluoride in the hopper. Variations of 1 pound per hour come to the inspector's attention.

The concentration of fluoride in the water is controlled by an electronic instrument. The amount of fluoride added to the water depends on the rate of water utilization. The maximum capacity of the fluoride feeder is about two times the amount normally used; the feeder could not bring the concentration of fluoride above 2.5 ppm. Such water, although it could cause mottling of the teeth if consumed for years, is not harmful systemically. About 1 ton of fluoride per million gallons of water would be required to bring the concentration up to 200 ppm, the concentration which can produce acute fluoride toxicity. However, since the feeder has a maximum capacity of 700 pounds, this situation could not occur.

The methods used to detect and prevent any significant deviation from 1 ppm of fluoride in the water include the following: hourly check of the weight of chemical fed at the hopper; daily five-minute Rubin test; continuous record of fluoride added, as shown on the recorder; weekly tests on four distribution system samples and on a composite of 18 distribution system samples by the standard method of Scott-Sanchis, and monthly tests by the Massachusetts Department of Public Health of water taken from four points in the distribution system.

*Chestnut Hill, Mass.*

Pathology

## Xerostomia

Walther Müller. *Deut.Zahnärztebl.* 12:378-380 June 8, 1958

Xerostomia, dryness of the oral cavity, occurs in an idiopathic (usually permanent) or a symptomatic (usually temporary) form.

Idiopathic xerostomia is associated with pathologic changes in one or more of the salivary glands. These changes may be caused by congenital aplasia, Mikulicz's disease, Sjögren's syndrome, lymphogranuloma or other diseases and conditions which affect the tissues of the salivary glands. This form of xerostomia sometimes appears after roentgenotherapy used in treatment of malignant oral tumors or as a reaction to surgical removal of such tumors.

Symptomatic xerostomia often accompanies neuroses. Psychologic disturbances such as extreme fear, anxiety, overexcitement, and also various types of phobia may produce the symptoms of xerostomia. In these instances, the salivary glands do not show any pathologic changes; the emotional disturbances, however, tend to affect the salivary excretion temporarily.

Avitaminoses, disturbances of the central nervous system, drug reactions (to antihistamines) and habitual mouth breathing cannot be ruled out as causative factors.

Xerostomia occurs mainly in women during or after the menopause. The usual complaint of such patients is difficulty in mastication. Because the oral mucosa is not lubricated sufficiently, fissures appear which may become infected. The teeth become brittle, and the incidence of caries in such patients is increased.

Generally the dryness begins on the tongue and extends gradually to the entire oral mucosa and the laryngeal and pharyngeal regions. Frequently, the function of speech is impaired. Sometimes, extreme instances of xerostomia are accompanied by general dryness of the skin, simulating scleroderma adultorum.

Roentgenographic examinations reveal a centripetal atrophy of the affected salivary glands with a diffuse, interlobar and interlobular sclerosis. The branching of the salivary ducts appears irregular and the affected glands show structural changes. Diagnosis and differential diagnoses are facilitated by sialographic examinations.

Before any effective treatment can be initiated, the causative factor or factors must be determined. Pilocarpine hydrochloride (0.3 cc. in 15 cc. distilled water), given three times daily, stimulates the salivary excretion. Vitamin therapy is helpful in instances of xerostomia due to avitaminoses, and in endocrine disturbances, hormonal treatment (estrogen) is indicated.

Fissures in the oral mucosa, due to xerostomia, should be treated topically by covering the affected region with a thin layer of sodium borate glycerin.

*Römerhof, Zurich, Switzerland*

## Improvement in torticollis after elimination of dental foci: report of case

K. M. Brunthaler. *Zahnärztl.Rundschau* 66:54-55 Feb. 5, 1957

Torticollis or wryneck is usually caused by a unilateral contraction of the sternocleidomastoid muscle and results in an unnatural position of the head and neck. This condition can be either congenital or acquired.

In the case reported, the patient, a 37 year old man, suffered from a torticollis which prevented him from working. Medical treatment obtained no improvement.

The patient was referred to the Institute for Neurosurgery for examination, observation and treatment. Clinical, physical, roentgenographic and electroencephalographic examinations did not result in a clear diagnosis. The opinions of the examiners varied between inherited, psychogenic, rheumatic and spasmodic torticollis. The condition, however, did not respond to neurosurgical treatment.

Two weeks later, the patient complained of severe toothache and appeared at the dental clinic. After roentgenographic examination, the presence of dental foci was established. The pulp

of two teeth (the left upper second molar and the right upper central incisor) was nonvital after faulty root canal fillings. No visual, pathologic alterations in the apical region were observed.

After elimination of the dental foci and extraction of the devitalized teeth, a sudden improvement occurred not only in the patient's oral condition but in the symptoms of torticollis.

Four months after dental treatment, the general health of the patient was improved, and he could again report for work.

It can be assumed from the specific course of the disease that it was a myogenic torticollis caused or promoted by the presence of dental foci. Inherited or neurogenic torticollis could not have responded to dental treatment.

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### Hodgkin's disease discovered 125 years ago

W. Trummert. *München.med.Wschr.* 99:1169-1175 Aug. 16, 1957

A hundred and twenty-five years ago, Thomas Hodgkin (1798–1869), an English physician, reported his observation of "peculiar manifestations of the lymph nodes and the spleen."

Since then this condition has been called "Hodgkin's disease," and is clearly defined by pathoanatomic research.

The disease is characterized by an infectious granulomatous condition in which particularly the lymphadenoid tissues of the oral mucous membrane, the tonsils, the spleen and the bone marrow are involved. It is mainly encountered in males between the ages of 10 and 35 years, and seldom in females.

Hodgkin's disease has a rather insidious start. A unilateral gland enlargement in the oral cavity or the neck, frequently painless, is the first symptom. Later an encircling chain of enlarged and inflamed lymph nodes appears along the course of the lymph vessels. The most striking feature is the persistence of these swellings which differentiates this disease from other glandular enlargements. The enlarged nodes vary in size, are movable and palpable. The temperature often exceeds 102°F.

In its earlier stages Hodgkin's disease is difficult to diagnose. In differential diagnosis, lymph node tuberculosis, leukemia, true lymph sarcoma and endothelioma should be considered.

The average patients with Hodgkin's disease live two or three years after the earliest symptoms are noted. In isolated instances people have survived 10 to 15 years.

Unfortunately a specific method for treating Hodgkin's disease has not yet been discovered. Experimentation, however, is being carried out and new technics are being developed which offer encouragement.

Although radium irradiation and roentgenotherapy have obtained relatively favorable results, the prognosis still is extremely serious.

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### Congenital fossettes of the lower lip: embryogenesis and clinical significance

Frank W. Pirruccello. *Proc.Inst.Med.Chicago* 22:100-101 July 15, 1958

Congenital fossettes of the lower lip, first described by Demarquay in 1845, constitute an infrequent congenital anomaly. The anomaly is characterized by two openings which appear on the vermilion portion of the lip close to the junction of the skin and mucous membrane. These openings usually are symmetrically placed about 1 cm. from each other. The orifices may appear as simple minute openings in the lip, or they may be found at the summit of nipplelike papillae raised up from the remainder of the lip, appearing much like a double lip. These tracts run down through the substance of the lip and end blindly in the orbicularis oris muscle.

Congenital fossettes sometimes are associated with other congenital abnormalities. They are commonly found in families where cleft lip and cleft palate are found. Often they are associated with cleft lip and cleft palate or with the congenital absence of maxillary teeth. Fossettes may be found in several members of the same family, and it appears that they can be passed from generation to generation. Congenital fossettes may be the only indicator of an individual with potential cleft lip or cleft palate in a family. The preponderance of fossettes is found in female patients.

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### Primary hepatoma with metastasis to the mandible

Arthur Dick, Sterling G. Mead, Maurice Mensh and William E. Schatten. *Am.J.Surg.* 94:846-850 Dec. 1957

Primary hepatoma is uncommon, hepatoma with metastasis is rare, but primary hepatoma with metastasis to the mandible is without precedent up to this point.

A 57 year old white man, first seen by Mead on May 7, 1956, had had a third molar removed 30 months earlier. About two weeks after the extraction, pus had formed and the region was lanced. After about one month the patient had noticed swelling with numbness and tingling of the lip. He consulted a dentist, who incised and drained the region. The swelling did not subside and another incision and drainage were done about two weeks later. Severe hemorrhage followed, which could be controlled only by suturing a pack on the wound. The following month the patient again consulted his dentist and was told that the region looked like a "blood blister." This was probed and bled excessively, requiring sutures for hemostasis.

The patient had had a heavy alcoholic intake for 35 years. His diet had been deficient in fresh vegetables of any kind. In the past year there had been a sudden pronounced decrease in libido with some concomitant decrease in potency. He had lost about 4 pounds in the four months before examination.

Examination of the local lesion on May 11, 1956, revealed an elevated spongy mass on the crest of the right side of the mandibular alveolar ridge, extending from the second bicuspid region to the first part of the ascending ramus. This part of the jaw was edentulous. The mass was moderately movable, relatively painless but slightly tender because of a recent incision and drainage. There were no palpable masses in the neck. Roentgenographic examination indicated that the mass had invaded the mandible.

Biopsy elicited a report of "chronic inflammatory tissue." An incision was made around the tumor down to bone, and the mass elevated. Here an extensive cavity in the bone was palpable and visible. It was unquestionably an invasive, destructive malignant tumor. The mass was removed. The report on the mass on frozen section was "malignant tumor." The comment of the pathologist was, "If I hadn't seen you remove this from the jaw I would swear it was a liver biopsy."

An exploratory laparotomy was performed on June 28, 1956, and the metastatic lesion of the mandible was proved to be from a primary carcinoma of the liver. Information received from the patient's local physician in April 1957 indicated a rapid downhill course.

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### Foreign bodies in the jaw

*Zahnärztl.Praxis* 9:113 May 15, 1958

*Q.*—The patient, a 13 year old girl, complained of unbearable pain radiating from the left side of the upper jaw. Clinical observation showed the presence of abnormally large amounts of liquid in the anterior region of the upper jaw. The necessary extraction of the left upper central incisor was followed by discharge of a large amount of dark yellow pus. Full-mouth roentgenograms revealed the presence of a cyst adjacent to the left upper lateral incisor. A comparatively small granuloma developed near the empty alveolus. Both neoplasms seem to be filled with rod-shaped particles appearing in roentgenograms as opaque stripes. Are those little rods foreign bodies or crystals formed by the semisolid contents of the cyst. Are immediate tooth extraction and surgical removal of cyst and granuloma indicated?

*A.*—The rod-shaped particles probably are foreign bodies which were pushed into the lumen of the cyst by incorrect instrumentation during root canal treatment. The described discharge of a large amount of dark yellow pus seems to indicate that the cyst had been perforated during tooth extraction. The usual content of a cyst, minute particles of osseous tissue or tiny cholesterol crystals, appears semi-translucent in roentgenograms and never opaque. Clinically, the presence of the cyst and the granuloma and not that of the foreign bodies is significant. Immediate apicoectomy and surgical removal of both the cyst and the granuloma are indicated.

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### Infectious mononucleosis

Heinz Fischer. *Bl.Zahnhk.,Zürich* 19:70-73 May 1958

Infectious mononucleosis, a communicable, acute and self-limiting disease of unknown etiology, is also known as glandular fever, lymphocytic or monocytic angina or acute benign lymphoblastosis.

It occurs in the form of a mild epidemic often attacking all pupils of kindergartens or schools.

It is characterized by a symptom complex including high temperature, oral lesions, lymphadenopathy (especially in the cervical region), edema and inflammation of the soft palate, the pharynx, the uvula and the oral mucosa, acute respiratory infection and the presence of atypical lymphocytes and heterophile antibodies in the circulating blood. A maculopapular rash may cover the skin and mucous membrane of the maxillofacial region. *Bacteroides fusiformis* (Vincent's bacillus) and herpes virus may become secondary invaders, affecting the oral cavity, the nose and throat.

The main feature of the blood picture consists in leukocytosis with 20,000 leukocytes per cubic millimeter and the monocytes increasing up to 90 per cent.

The course of the disease runs from one week to several months. Spontaneous recovery occurs frequently.

Because the etiology is unknown, the treatment can be directed only toward alleviation of the symptoms.

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### The oral pathology of domesticated animals

R. J. Gorlin, J. J. Clark and A. P. Chaudhry. *Oral Surg.,Oral Med.& Oral Path.* 11:500-534 May 1958

This study was undertaken to ascertain the various types of oral lesions seen in domesticated animals and their frequencies. The material was collected from the files of the surgical pathology division of the School of Veterinary Medicine, University of Minnesota. The material represents 103 successive oral lesions obtained by biopsy from 90 dogs, 6 cows, 5 cats, 1 sheep and 1 horse.

The following benign oral tumors were noted: epulis, 28 dogs; infectious papillomatosis, 9 dogs; noninfectious papilloma, 1 dog; lipoma, 1 dog, 1 cow; neurofibroma, 1 dog; ameloblastic odontoma, 1 cow; sebaceous adenoma, 1 dog; fibroxanthoma, 1 cat; nevus, 1 dog, and hemangiopericytoma, 1 dog.

The following malignant oral tumors were noted: melanoma, 18 dogs; squamous cell carcinoma, 5 dogs and 2 cats; mast cell tumor, 4 dogs; basal cell carcinoma, 3 dogs; lymphoblastoma, 3 dogs; adenocarcinoma, 2 dogs and 1 sheep; fibrosarcoma, 2 dogs, and chondrosarcoma, 1 dog.

The following miscellaneous oral lesions were noted: pyogenic granuloma, 9 dogs and 1 cat; actinomycosis, 4 cows; bovine hyperkeratosis, 1 cow; fibrous dysplasia or osteoma, 1 horse; eosinophilic granuloma, 1 cat, and foreign body granuloma, 1 dog.

The bibliography contains 80 references.

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### Cytomegalic inclusion disease

G. Seifert and J. Oehme. *Deut.med.Wschr.* 82:1759-1763 Sept. 20, 1957, and *German M. Monthly* 3:25-27 Jan. 1958

Cytomegalic inclusion disease, a generalized salivary gland virus disease, has been considered a disease entity since H. Ribbert (in 1881) reported the case of a syphilitic stillborn infant with compensatory hypertrophy of the epithelium associated with nephritis. In 1904, he reported two additional cases of similar changes in the parotid glands of two children. Protozoan-like cells were observed in the parotid glands and the kidneys.

On the basis of 83 instances of cytomegalic inclusion disease, observed at the Pathologic Institute of the University of Leipzig and at the Pediatric Clinic of the University of Marburg, both in Germany, the conclusion was reached that the causative factor must be an as yet unidentified virus.

The disease is common among animals (guinea pigs, hamsters, mice, rats, moles, foxes, minks and monkeys), providing widespread possibility for human infection.

The diagnosis rests on the demonstration of giant cells with inclusion nuclei in tissues or body fluids (saliva and urine). The inclusion bodies (intranuclear inclusion) are composed largely of desoxyribonucleic acid.

Cytomegalic inclusion disease may occur in infants, especially those born prematurely. An intra-uterine infection is thought to be responsible. Because this disease usually appears as a generalized blood dyscrasia with hepatomegaly, erythroblastosis fetalis must be considered in differential diagnosis.

In infants, cerebral, gastrointestinal, hepatic, oral, pulmonary and splenic symptoms may be prominent. There exists a high coincidence of the disease with congenital malformations. Salivary glands (parotid glands), kidneys, lungs and liver (in order of frequency) are most frequently affected.

The disease is comparatively rare in children older than one year (only 4 of the 83 instances observed).

No specific preventive or therapeutic methods are known, although cortisone therapy is now being tried.

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### Erythema multiforme exudativum or Stevens-Johnson syndrome

Y. de Fooz. *Arch.stomat.,Liège* 13:84-96 April 1958

Stevens-Johnson syndrome, first described in 1922, is also known as erythema multiforme exudativum and ectodermosis erosiva pluriorificialis. This syndrome is comparatively rare. It is characterized by an acute onset and high temperature and its accompanying symptoms are vesicular eruptions on the skin and severe inflammation of some or all of the orifices of the body.

The cause is unknown, although an unidentified virus is suspected. Bacteriological studies of the contents of vesicles and secretions, however, have not furnished evidence of a virus infection. Some authors assume that the syndrome is due to an increased sensitivity to allergens.

The syndrome usually occurs in young boys. Stomatitis is an initial feature with oral vesicles breaking down and forming ulcers on the buccal mucosa, tongue and the inner surface of the lips. The inflammatory process becomes severe. Hemorrhage in the oral cavity occurs frequently. There is an increase in salivation and disturbance of mastication. Conjunctivitis, bilateral and of varying severity, may occur at a later stage and is accompanied by rhinitis. The lesions, appearing on various parts of the body, mainly in or around the mouth, may be macular, papular or vesicular and vary greatly in size. Within each lesion, a hemorrhagic center develops with subsequent crusting.

The disease usually subsides spontaneously. Chemotherapy and supportive treatment consisting of large doses of vitamin B complex (especially nicotinic acid) and vitamin C are recommended. For the oral lesions, the only treatment required consists of alleviative procedures such as strict mouth hygiene and the application of dyes (5 per cent benzoparacresol in glycerine and water).

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### Penicillin, streptomycin and other antibiotics causing allergic reactions in dentists, physicians and their assistants

C. Humperdinck and K. Wendel. *Landarzt* 34:104-105 Feb. 20, 1958

Hay fever, asthma, urticaria, migraine, colitis and dermatosis (eczema) may be typical allergic manifestations in patients who are occupationally exposed to antibiotics, especially penicillin and streptomycin.

More than 40 per cent of the patients treated for contact dermatitis at the department for industrial medicine of the Hygiene Institute of the University of Tübingen, Germany, were dentists, physicians and their assistants (nurses).

Although the list of substances which can act as allergens is long and ever-increasing, drug allergy (especially to antibiotics) becomes more frequent as chemical and pharmaceutical research yield new and more complex antibacterial agents.

The symptoms of drug allergy depend on the manner of contact as well as on the varying in-

dividual susceptibility of different tissues. Diagnosis usually is facilitated by skin tests. Positive skin reactions, remaining for some time after the clinical sensitiveness has subsided, reflect the past history rather than the present condition. In dentists, physicians and their assistants, afflicted with specific hypersensitiveness to certain drugs, the clinical history offers the best method for identifying the causative agent (agents), treatment planning and prognosis.

The adjective "allergic" indicates that the tissues of the patient play an active part in producing and reproducing allergic reactions. The increasing incidence of drug allergy (caused by individual hypersensitiveness to a specific antibiotic) in dental and medical practitioners makes it important to advise them to be extremely cautious in handling drugs such as penicillin, streptomycin and sulfonamides. Wearing of surgical gloves and face masks is indicated.

Cortisone and adrenocorticotrophic hormone (ACTH) may be used to increase the defense mechanism of the body and to relieve the symptoms of allergic diseases. Although the allergic reactions are not inhibited by these hormones, the manifestations usually are modified in some—still undetermined—manner. When medication with these hormones is continued for too long a time, however, these new drugs may also lead to complications which are serious. This treatment method, therefore, does not represent the final answer to occupational and nonoccupational allergies.

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## An explanation of the pathogenesis, physiology and therapy of Meniere's disease

Maynard Murray and William R. Stewart.
*A.M.A.Arch.Otolaryng.* 67:184-196
Feb. 1958

Evidence is submitted in confirmation of the etiologic concept of focal infection in hydrops labyrinthi. The authors maintain that:

1. Endolymphatic hydrops (Meniere's syndrome) is the result of changes in the water-holding capacity of the colloidal structures caused by toxins or organismic invasion, specifically infected foci.

2. The infected foci predominate within the structures of and around the teeth or sinuses, but other regions of infection (tonsils, tongue, adenoids, and gallbladder) may be causative in some instances.

3. Young's work (1949, 1950) supports the focal infection theory by presenting an anatomic framework showing the lymphatic pathways along which organisms or toxins could travel.

4. Routine roentgenograms of the sinus, and diagnostic irrigations, often fail to show infection when it is present.

5. Infected foci are not necessarily removed by routine teeth extractions or Caldwell-Luc operations.

6. Problems of occlusion introduce a variable associated with the temporomandibular joint, complicating the symptoms of hydrops labyrinthi and necessitating the establishment of normal dental occlusion.

7. The removal of infected foci attacks the cause of hydrops labyrinthi, and must be considered superior to other therapeutic procedures.

Nine case reports illustrate successful application of the theory of managing hydrops labyrinthi through the removal of oral focal infection and the maintenance of good temporomandibular function by opening the bite and balancing the occlusion.

Focal infection played a predominant role and was found in every instance of hydrops labyrinthi seen by the authors. Other diagnosticians have overlooked or failed in their search for a focus of infection because they have looked primarily for pus.

Two outstanding physical findings were apparent in this series of cases, one or both always being present. If the examiner passed his finger with constant pressure from the patient's maxillary alveolar process posteriorly to the region of the first molar, the patient often complained of sensitivity on one or both sides. As the examiner proceeded back to the tuberosity with continued pressure, the patient usually would complain of severe tenderness. On occasion, the mere examination of the patient in this manner precipitated severe vertigo; in three patients a typical vertiginous and tinnitus attack was produced by this manipulation. In addition, if the examiner placed one or two tongue depressors between the molars

on the sensitive side and asked the patient to bite down vigorously, symptoms of hydrops labyrinthi often would be precipitated. It was noted in a number of patients that the distance between the ramus of the mandible and the maxilla on one side differed considerably from the corresponding distance on the other side. Usually there was less space between the ramus of the mandible and maxilla on the affected side than on the unaffected side. Such observations always were made in patients with overbite or closed bite, or in instances of protrusion due to malocclusion. This suggests that a mechanical impingement of the lymphatics could be capable of impairing the lymphatic drainage mechanism of the labyrinth.

Even though the patient be edentulous, one cannot overlook the possibility that he may have disease of the dental arch. It is not adequate to remove a tooth with periodontal disease; all the diseased bone must be removed in order to eradicate a focus of infection.

After removal of the dental and sinus infections, the infections in the nasopharynx often drain spontaneously and disappear.

In the cases reported, the chief treatment was alveolectomy.

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## Syphilis, the "forgotten" disease, a cause of many false diagnoses

O. Gans. *Klin.Wschr.* 36:544-548 June 1, 1958

The enormous successes of antibiotic treatment methods seem to have made syphilis a "forgotten" disease. Although many authors have assumed that syphilis was completely or almost eliminated, this disease still exists and by simulating symptoms and syndromes usually associated with other diseases it causes many diagnostic errors and treatment failures.

Among the many case reports presented at the last meeting of the German Medical Society in Frankfurt/Main, 1958, the histories of three patients demonstrated that syphilis of the jaws, the soft palate and gummatous destruction of the tongue had been diagnosed as and treated for different diseases.

Case 1. The patient, an eight year old boy, showed a hard, painless lump of rubberlike consistency on the tongue, breaking down into small ulcers. The condition was diagnosed as tuberculosis. Treatment was unsuccessful. Bacteriologic examination of specimens taken from the mucous patches of the tongue, revealed the presence of *Treponema pallidum*, the causative agent of syphilis in man.

Case 2. The patient, a 43 year old woman, had been treated for "rhinitis" for six months without success. A comparatively small ulcer was detected on the lower jaw. Surrounding the region was a fibroblastic reaction leading to the formation of fibrous tissue. By microscopic examination, the ulcer, cut into sections, appeared as a yellow mass. The complement-fixation (Wassermann) test and flocculation serum reaction (Kahn and Kline) test were positive.

Case 3. The patient, a 29 year old man, showed a perforated soft palate, which condition was diagnosed as tooth fistula. Although the patient's incisors had the characteristic symptoms of prenatal syphilis, only after the occurrence of a symmetrical swelling on the hard palate (which was diagnosed as a "sarcoma") was a serological examination made which revealed the presence of *T. pallidum*. The diagnostic error (carcinoma) produced in the patient carcinophobia and led to suicidal attempts, fortunately unsuccessful.

These case reports, as well as many others not involving the oral cavity, show that syphilis is by no means a completely eliminated disease and should not be forgotten in diagnosis and differential diagnosis.

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## Unexplained facial spasm

Warren Durrant. *Lancet*
No. 7034:1336-1337 June 21, 1958

A ten year old girl was referred to the hospital with a spasm consisting of depression of the mandible and retraction of the tongue. The spasm began an hour after the extraction of two lower left molars two days before. Deglutition was possible, but not mastication. There was no other spasm, and no history of recent injury and no dislocation of the jaw.

The child, on examination, could not move her jaw or tongue. Chvostek's sign was positive on

both sides in the distribution of the mandibular division of the trigeminal nerve. Trousseau's sign was negative, and there was no carpopedal spasm.

The condition gradually abated over the next three days, after which the child could eat normally. Chvostek's sign persisted for five days.

It was suggested that the increased nervous irritability may have been due to facilitation at the synapses of the reflex arc, involving the trigeminal and facial nerves, and brought about by the presistent stimulation of the former nerve.

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### Halitosis

*Brit.M.J.* No. 5088:117 July 12, 1958

Q.—What may be the cause of halitosis in a patient who has no infection in the mouth or respiratory tract?

A.—Offensive breath must come from either the nose, mouth, stomach, intestines or the lungs. One must exclude the possibility of chronic sinusitis, chronic tonsillitis, dental sepsis, esophageal pouch, gastric stasis and bronchiectasis. If these can be excluded the most likely remaining cause is absorption of volatile fatty acids from the intestines, which pass from the blood into the lungs. There is no reason why belched air should cause halitosis. It is merely ordinary air swallowed as the result of relaxation of the upper end of the gullet. Some air passes into the stomach, but most of it inflates the esophagus and is then brought up explosively.

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### Observations upon the oral mucosa of the African

Bernard T. Squires. *Central African J.Med.* 4:104-111 March 1958

The oral cavity is of great clinical importance, for it lends itself readily to inspection and examination and, like the eye, can reflect the presence of disease in other regions.

The lingual mucosa of the anterior third of the dorsum is easily examined. Permanent records of its appearance are obtained readily. The tongue is protruded as far as possible, cleaned with a piece of gauze, a special ink applied with another piece of gauze or a squeegee, and impressions taken by the first application of a piece of glazed paper to the inked area. The anatomic features thus recorded are the filiform and fungiform papillae; they are shown more clearly than by any photographic method. The filiform papillae appear on the print as round or star-shaped dots; the fungiform papillae, which are smooth and pick up but little ink, and that only on the sides, are shown as round holes in a surrounding dark background.

In health there is a definite ratio between the number of filiform and fungiform papillae per unit area (4-5:1). In malnutrition the filiform papillae tend to disappear so that the ratio is reduced. Small patches of atrophy become visible. At a more advanced stage the fungiform papillae also vanish and the entire mucosa becomes disorganized. Appropriate treatment will reverse the tongue changes, and tongue prints provide a convenient means of recording mucosal regeneration.

The fluorescence of the tongue induced by exposure to ultraviolet light was noted by v. d. Vergh (1928), who found that the tongue exhibited "more or less visible red fluorescence." According to Costello and Luttenberger (1944), the absence of fluorescence is suggestive of vitamin B group deficiency. To test this supposition, observations extending over eight months were made on a group of African school children. Of 38 children with obvious clinical signs of malnutrition, only five (13 per cent) showed a very faint fluorescence of the tongue under ultraviolet light; the tongues of the remaining 33 children were nonfluorescent.

Examination of the tongue by sodium vapor light sometimes is useful in detecting small lesions which might otherwise escape notice; for example, tiny ulcers or hemorrhagic bullae.

To obtain a buccal smear, the buccal mucosa is gently scraped with any blunt instrument of suitable size and the scrapings smeared on a 3 by 1 inch slide, which is then immersed before the smear dries, in Papanicolaou's fixative for at least ten minutes and dried. Any good nuclear stain will serve for staining. In instances of malnutri-

tion, two changes appear in the picture: (1) a large proportion of the cells tends to fragment or to stain unevenly, and (2) a large number of leukocytes and cells with deeply staining nuclei and little cytoplasm, probably lymphocytes, are distributed plentifully all over the smear.

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### Neonatal osteomyelitis: a disease different from osteomyelitis of older children

A. M. Clarke. *M.J.Australia* 1:237-239 Feb. 22, 1958

Neonatal osteomyelitis differs so greatly from acute hematogenous osteomyelitis in older children that it should be regarded as being a separate disease entity.

Although it is comparatively rare, during the past five years, 24 patients with this disease were observed and treated at the Royal Children's Hospital in Melbourne, Victoria, Australia.

In 21 patients, the first symptoms occurred in the oral cavity and involved mainly the oral mucosa and the upper jaw. The source of the initial infection could not always be determined but, in the majority of instances, direct contamination from the mother, the nurse or the nipple of the feeding bottle was the causative factor. The microorganism usually responsible for the infection is *Staphylococcus pyogenes* var. *aureus.*

In the early stage there is an infection about the crypt of the developing first upper molar and the adjacent region. Frequently the molar becomes larger than usual and traumatizes the maxillary sinus. The infection of the crypt spreads to the orbit, the canine fossa, the palate and the paranasal sinuses.

The onset is sudden and the symptoms develop within a few days. Typical symptoms include the following: induration and edema of the cheek; edema of the eyelid with proptosis of the eye; unilateral nasal discharge; swelling of the entire region of the upper alveolar bone with discharge of pus, and palatal swelling. Multiple fistulas in the oral cavity form, erupt with a discharge of pus, and close up spontaneously.

Temperature from 104° to 105° F. and rapid respiration are the usual secondary symptoms. The septicemic stage lasts for about ten days and when drainage occurs the temperature drops gradually.

Sequestrums are formed from the orbital margin, the outer surface of the upper jaw and from unerupted teeth. The pieces of necrotic bone that have become separated may be extruded or can be removed after the septicemic stage has passed. Sequestration, however, may continue for months.

Blood culture tests often give negative results. Premature eruption of the upper teeth is a characteristic phenomenon.

Successful treatment depends on early diagnosis, adequate chemotherapy and prevention of dislocation and deformity. Early diagnosis is difficult and often depends on the disease's being suspected and on the recognition of the early symptoms.

In order to keep ahead of the drug-resistant characteristics of *St. pyogenes* var. *aureus,* the latest accepted antibiotics should be used in adequate doses and for a sufficient time, three weeks being the minimum. Oral abscesses should be incised, drained and irrigated with a penicillin solution four times daily.

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### Geographic tongue

*Zahnärztl.Praxis* 9:113 May 15, 1958

*Q.*—What are the causes of the so-called geographic tongue? Which recent treatment method can be recommended? Is the prognosis favorable?

*A.*—Erythema migrans or glossitis areata exfoliativa (the so-called geographic tongue) causes a chronic annular or circinate desquamation of the epithelial tissue of the tongue. The coating resembles a geographic map. The cause is unknown, although hereditary influence or neuropathic derivation is suspected. The condition is seen in early life and is generally persistent. The tongue's fungiform papillae appear as shiny dark red eminences. The lesions generally advance in an anterior direction and temporary healing occurs at the distal side. The only subjective symptom present is itching. Because there are no serious symptoms, treatment is not imperative, and because the etiology is unknown, it can-

not be directed toward removal of the underlying causes. Preventive oral hygiene, by using alkaline mouthwashes, is recommended. The prognosis, however, is as uncertain as the etiology.

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### Atypical facial paralysis during pregnancy

W. Föllmer. *Medizinische* 34:1148-1157 May 1958

During periodic dental examinations of pregnant women, an atypical facial paralysis with a diversity of clinical symptoms is seen occasionally.

Psychogenic pain, radiating from the maxillofacial region, usually is constant and is manifested as a burning and deep-seated, agonizing sensation, resulting from stimulations of the seventh cranial nerve or its branches.

Three case reports are presented in which the initial pain below and behind the ear was followed by a sudden paralysis of the muscles of the left side of the face. The partial paralysis of the facial nerve involved also the ends of the left deep temporal nerve. The muscles of the afflicted side of the face were immobile, the angle of the mouth drooped, and when the patients tried to smile their mouths were drawn toward the unaffected side. When eating or drinking, fluid or food escaped from the mouth. The left lower eyelid drooped and the eye could not be closed. These symptoms are dissimilar to those occurring in facial paralysis due to neuralgia.

Treatment consisted (in the three instances reported) in daily intravenous injections of 1 mg. histamine phosphate in 250 ml. of distilled water. Recovery from facial paralysis occurred in two patients within one week. In the third patient, recovery was delayed. Decompression of the facial nerve by opening the facial canal from the stylomastoid foramen to the lateral semicircular canal was indicated and successfully carried out.

The causes of this atypical facial paralysis occurring during pregnancy probably are irregularities in the circulation and disturbances of the endocrine metabolism.

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### Results of treatment of carcinoma of lower lip

Simon Krantz, Israel R. Berger and Pierpont F. Brown. *Am.J.Roentg.* 78:780-789 Nov. 1957

The results of irradiation and surgery in the treatment of 189 patients with carcinoma of the lower lip at the Veterans Administration Hospital, Atlanta, Ga., in the period from 1935 through 1950 are evaluated and compared.

The treatment from 1935 to 1941 was by radium in the form of a mold. After 1941, this method was replaced by superficial roentgenotherapy. In this same period, 18 patients were treated with a high voltage technic. In 1947, many of the patients were treated primarily by surgery. There is a fairly equal distribution of the patients treated by the three modalities, that is, radium, roentgen therapy and surgery.

The relative cure rates of the initial treatment were 86 per cent with radium therapy, 88 per cent with superficial roentgen therapy, 85 per cent with deep roentgen therapy and 85 per cent with surgery in lower lip lesions without metastatic lymph nodes.

In 34 patients, or 18 per cent, lymphadenopathy was present on admission. Of the remaining 155 patients, only eight developed metastatic lymph nodes later in the course of follow-up. The incidence of metastatic diseases in carcinoma of the lower lip is fairly low. This supports the theory that prophylactic neck dissection in carcinoma of the lower lip is unnecessary. It should be performed only when clinically demonstrable metastases are evident. The present trend is away from prophylactic neck dissection.

Treatment of the initial carcinoma of the lower lip by any of the accepted modalities yields remarkably uniform results. The recurrence and incidence of metastases after initial, careful treatment is low. In patients with operable metastatic disease, a 50 per cent cure rate may be anticipated with surgery. The experience with patients having inoperable metastases is disappointing.

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Therapeutics

### An antibacterial preparation from hemp (Cannabis sativa L.)

L. Ferenczy, L. Gracza and I. Jakoby. *Naturwissensch.* 45:188 April 15, 1958

Seeds of hemp—like those of various other plant species—contain antibacterial substances. The active compound can be found on the surface of seeds and it inhibits the increase of gram-positive bacteria.

Recently Drobotko and his co-workers have demonstrated an antibacterial compound in Russian hemp. Investigations, carried out at the Institute for Plant Physiology of the University of Szeged, Hungary, have proved that the active antibacterial substance can be found in comparatively significant quantities not only on the surface of hemp seeds but all over the terminal parts of the plant and in the resin covering the leaves and seeds.

Decoctions obtained from resinous parts of various hemp species have been used in the treatment of infectious, especially inflammatory, oral diseases.

The antibacterial compound investigated was extracted from the resinous parts of *Cannabis sativa L.* ("Bologniensis"). When the extract was isolated and purified, an active antibacterial, orange colored, amorphous, odorless and thermostabile preparation was obtained which dissolves easily in organic solvents and alkali but poorly in water.

The antibacterial activity of the preparation was examined by the horizontal agar diffusion (hole plate) method. Every bacterial culture was kept at the optimum temperature. Incubation time varied from 48 to 96 hours.

Test microorganisms included: *Bacillus cereus* var. *mycoides, B. megatherium 597, B. subtilis* var. *panis, Sarcina flava, Staphylococcus aureus, Escherichia coli, Pseudomonas aeruginosa, Salmonella paratyphi, Shigella shigae* and *S. sonnei, Streptomyces griseus, Pediococcus cerevisiae, Chromobacterium ochraceum, Micrococcus niger, Penicillium chrysogenum* and *P. expansum.*

The preparation proved to be ineffective on gram-negative bacteria, yeasts and molds but extremely effective on all gram-positive bacteria.

The active product obtained by isolation as well as the described preparation show an intensive hashish reaction. After comparison with extracts obtained from Hungarian and foreign hemp species, it became evident that the antibacterial effect of hemp preparations is proportionate to the intensity of the hashish reaction.

The investigation is being continued to determine whether cannabinol or its derivatives are responsible for the antibacterial activity of hemp resins, and whether the preparation can be used safely in treatment of infections or inflammations in the oral cavity.

*Institute for Plant Physiology, University of Szeged, Hungary*

### New long-acting sulfonamides

P. Rentchnick. *Schweiz.med.Wschr.* 88:362-368 April 12, 1958 [in French]

Antibiotics are not always effective in the treatment of oral infections. Sulfonamides, therefore, are sometimes indicated. When prescribed, 10 to 12 tablets of 0.5 Gm. are administrated orally. This may produce, however, a variety of toxic effects such as high temperature, rash, hepatitis, leukopenia and granulocytopenia.

The inconvenience of comparatively high doses and the hazards of toxic manifestations may be avoided if one of the new long-acting sulfonamides, sulfametoxypyridazin (Lederkyn) or sulfophenylpyrazol (Orisul), is used.

Both preparations can be administered in small doses (1 or 2 Gm. on the first day, and 0.5 to 1 Gm. thereafter). These long-acting sulfonamides have similar properties in addition to being highly soluble in urine. They are well absorbed from the intestinal tract, slowly eliminated by the kidneys and easily diffusible in all body fluids. They have a bacteriostatic activity equal to that

of sulfadiazine and superior to that of other sulfonamides.

Clinical trials in 100 patients with oral infections have established the value of these new compounds. They have the advantage of not provoking modifications in the normal oral flora.

Generally, oral infections are best treated by using antibiotics. With the long-acting, comparatively harmless, sulfonamides, sulfonamide therapy has again become the treatment of choice in instances of mixed infections or deep infections of an unknown origin in the oral cavity. In most instances combined antibiotic and sulfonamide therapy is recommended.

Because of their relatively low degree of toxicity and because of their effectiveness against the pathogenic microorganisms most frequently found in the oral cavity, the long-acting sulfonamides, Lederkyn and Orisul, can be used safely in dental practice.

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### Ethinamate (Valmid) in dentistry

Charles H. Redish and Ronald S. Ping.
*Oral Surg.,Oral Med.& Oral Path.* 11:742-744
July 1958

A clinical investigation of ethinamate, a new nonbarbiturate compound, was carried out at the Indiana University School of Dentistry. Tablets of 500 mg. of ethinamate and a placebo were administered orally in random order, using the double blind technic, to 212 unselected adult patients 20 to 30 minutes prior to surgery; 114 patients received ethinamate and 98 received the placebo. Both the patient's subjective response and the investigator's objective evaluation were recorded. The investigator based his opinion on the apparent degree of relaxation of the patient, regardless of the latter's subjective response.

Ninety-nine of the 114 patients receiving ethinamate felt that it was of help. Eight of the 98 patients receiving the placebo felt that it was of help. The evaluations of the investigators coincided closely with those of the patients: the investigators judged that 91 of the 114 patients receiving ethinamate were benefited, and that 4 of the 98 receiving the placebo were benefited. No side effects were noticeable with either ethinamate or the placebo while the patients remained in the clinic.

Ethinamate was satisfactory for the preoperative medication of dental patients undergoing oral surgical procedures. It produced sedation in a relatively short period, with no observed side effects.

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### Reactions to penicillin

Preben Foged. *Nord.med.* 75:458-460
March 6, 1958

During a period of two years (from January 1, 1956 to December 31, 1957), 8,954 medical and dental patients were routinely questioned about earlier treatments with penicillin and the occurrence of reactions after either injection or topical application.

Of these patients, 4,204 (46.9 per cent) had a record of previous penicillin therapy, and 221 had experienced side effects. In 113, the reactions consisted of urticaria; in 40, of malaise; in 30, of paresthesia, furuncles or edemas in the region of the face or the oral cavity; in 10, of glossitis, and in 16 of angioneurotic edema.

Among the rarer reactions to penicillin were arthralgia and expiratory dyspnea. None had experienced anaphylactic shock, exfoliative dermatitis or purpura.

It was demonstrated that injection and topical application of penicillin can produce a variety of unfavorable local reactions. Contact sensitivity to penicillin was observed in several patients, especially when crystalline penicillin had been used.

Serious reactions followed the administration of penicillin (in any form) to patients who had been sensitized through previous penicillin therapy. For treatment of patients with allergic diatheses in whom penicillin sensitivity may develop, penicillinase is the recommended substitute for penicillin. The enzyme antagonizes the antibacterial action of penicillin.

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## Biochemistry

### Studies on the acid decalcification of human dental enamel. II.

Joan E. Hills and H. R. Sullivan.
*Austral. D.J.* 3:101-106 April 1958

A study was made of the solubility of powdered dental enamel in saliva acidified with lactic acid to pH values of 7.0, 6.0, 5.0 and 4.0, under two sets of conditions—with and without the presence of carbon dioxide.

The enamel started to dissolve mainly in the pH range of 5.0 to 6.0. The enamel dissolved in the saliva in a manner comparable with that in citrate and lactate buffer systems.

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### The pH of saliva in healthy persons and in patients with dental caries and periodontosis

Juan Carlos Muracciole and Alfonso Castro.
*Rev.A.odont.,Argentina* 46:76-79 March 1958

The authors studied the pH of saliva in 50 persons (children and adults) with perfect dental health, in 50 children with caries (DMF rates of 2 to 10), and in 50 adults with periodontosis. The average values established in these three groups (7.3 ± .03, 7.4 ± .03, and 7.4 ± .03) were in the range of alkalinity and slightly above the neutral point. The constancy of the pH level of the saliva in normality and in disease should not be considered surprising, because a change in the pH level can be brought about only by significant variations in either the salt or the acid portion of the buffer system. Such variations are not to be expected in caries or periodontosis—conditions which are strictly localized in a certain region of the body and which have no significant repercussions on the internal medium, at least so far as has been established.

It appears that variations in the pH of saliva can be dismissed as factors in the causation of caries and periodontosis. Further investigations are now being carried out to determine the validity of the authors' initial premise, which is that only a change in the factors controlling the physicochemical balance of the internal mediums, including the saliva, since it is derived from the blood, can be responsible for a disruption in the physiological pattern of the mouth.

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### Amylolytic adaptational changes in mammalian saliva

A. M. Ugolev. *Bul.Exper.Biol.& Med.,USSR* 44:1423-1426 Dec. 1957

The saliva in some animals has a high amylolytic activity, whereas in other animals it has practically none, but it has not been clear why this is so.

Fistulas were made in the ducts of the parotid and submaxillary glands and the amylolytic activity of the saliva determined in the following animals: three monkeys, one adult fox, three fox cubs, eight guinea pigs, three rats and four cats. In addition, an examination was made of the saliva from the parotid glands of 24 human subjects fed a normal diet.

The saliva from herbivorous animals (rats, guinea pigs and monkeys) showed a considerably greater amylolytic activity with respect to starch than to glycogen, whereas the saliva of carnivores (cats and foxes) on the contrary splits glycogen more actively than it splits starch.

The specific activity of the saliva of man shows wide variations in different individuals. In one group zoolytic activity prevails, in another phytolytic, whereas in certain persons both activities are equal. Apparently, the saliva of a single individual also may vary within wide limits. The ratio of phytolytic to zoolytic activity depends to a considerable extent, although not entirely, on the type of diet. The action is chiefly phytolytic in herbivores and zoolytic in carnivores.

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## Periodontics

### Magnetic instrument for the recovery of broken curette fragments and other steel foreign bodies

Murray Schwartz. *J.Periodont.* 29:195 July 1958

During the curettage of deep periodontal pockets, the tip of the curet may fracture. Methods employed to remove such fragments include flushing the pocket with a jet of water, curetting, and packing gauze into the pocket and pulling it out in an attempt to trap the tip in the gauze mesh. An additional aid is the magnetic instrument described (see illustration).

The instrument shaft consists of a brass sleeve 4 1/2 inches long and 9/32 inch inside diameter, which holds two permanent magnets made of Alnico V. Each magnet is a rod 1/4 inch in diameter and about 3/4 inch long. The working ends of the instrument are steel and are held to the magnets by magnetic attraction. The magnetic force is transmitted through the steel working ends, which are held firmly in the brass sleeve by acrylic resin. A wooden spacer keeps the magnets in contact with the steel shanks. The steel ends may be made in any desired shape from worn or broken instruments. The end must be made as broad and blunt as possible, and the shank should have as few sharp angles as possible in order to obtain the maximum magnetic force at the tip.

The end of the magnetic instrument is inserted into the pocket in the region where the fragment is located. The end is moved from side to side as with a probe, withdrawn, and examined. If the steel fragment has been encountered or proximated, and if it is not embedded in tissue, generally the magnet will remove it.

The instrument may be sterilized by immersion in cold sterilizing solution. It should not be heated, since heat will soften the acrylic and may weaken the magnets.

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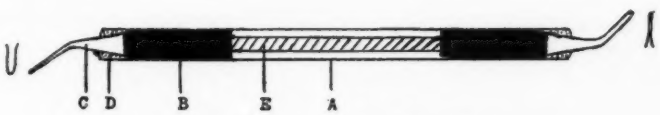


*A = Brass sleeve*
*B = Alnico magnet*
*C = Steel shank*
*D = Acrylic resin*
*E = Wooden spacer*

## Pathologic changes in form and function of the masticatory apparatus and their relations to periodontal disease

Andreas Nash. *Parodontol.,Zürich* 12:75-85 June 1958

The misconception that periodontal disease occurs only in adult or aged patients is still found among many dentists and has adverse consequences for the health of the masticatory apparatus. Initial changes in periodontal tissues have been observed in many children and adolescents.

There is no reason to assume that the periodontal structures in young patients should be exempted from inflammatory or degenerative processes.

To prevent an early periodontal involvement it is necessary to remove the cause before actual damage occurs or, at least, before the periodontal tissues have degenerated to such an extent that the only possible treatment is multiple extraction.

In each instance of periodontal disease more than one etiologic factor is involved. The most common cause is lack of oral hygiene which results in irritating supragingival and subgingival deposits. Malalignment of the teeth is an important contributory factor. Migration of teeth, deep overbite and various types of malocclusion may aggravate the condition.

Initial pathologic changes in the periodontal tissues in the child do not stop spontaneously. Dentists who ignore the presence of such changes and neglect to apply treatment during infancy and adolescence are guilty of aiding a pathologic process which years later will produce a mutilation of the masticatory apparatus.

Early treatment of periodontal disease is extremely important. Essential for its success are the following factors: (1) the patient's genuine desire for treatment and full confidence in it; (2) roentgenographic examination of the regions involved; (3) complete elimination of all calcareous deposits; (4) curetting, polishing, massaging with scrupulous attention to the slightest detail; (5) gingivectomy if indicated; (6) re-establishing the occlusal balance; (7) advising the young patient to practice oral hygiene (brushing, massaging, spraying), and (8) prescribing a diet rich in vitamin C.

There exists a need for better education of dental practitioners and the general public in regard to the etiology of periodontal disease, the necessity to enable the masticatory apparatus to carry out its normal physiologic functions, and the importance of exercising the maxillofacial region daily. Bad chewing habits must be detected and eliminated and oral abnormalities corrected.

Prevention always depends on treating the cause. There often exists a hidden systemic cause which is difficult to diagnose and to eliminate. Every disturbance in the periodontium of a child or an adolescent, therefore, must be considered as a symptom of periodontal disease which, untreated, may develop into a destructive and irreversible process.

The slightest deviation from normal function must be recognized and treated as early as possible in order to prevent serious complications such as a complete breakdown of the periodontal tissues.

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## The influence of occlusal trauma and protein deprivation on the response of periapical tissues following pulpal exposures in rats

S. S. Stahl, S. C. Miller and E. D. Goldsmith. *Oral Surg.,Oral Med.& Oral Path.* 11:536-540 May 1958

Thirty male rats of the Long-Evans strain, weighing an average of 300 Gm., were divided into three groups of ten animals. An occlusal channel was cut into the maxillary first and second molars on one side in the animals in groups 1 and 2. The cavity was filled with amalgam and carved level with the highest occlusal cusp, thus presenting a flat, high occlusal table. This procedure led to an exposure of the pulp in all animals. The ten animals in group 2 were placed on a protein-free diet for six weeks, and then on a normal diet for a second six week period. The animals in group 3 had no occlusal stresses; however, a cavity was drilled into the mesial wall of the maxillary right first molar near the gingival margin and a pulpal exposure was created. All animals were main-

tained for 12 weeks, sacrificed, the maxillae dissected and the tissue studied histologically. The following results were noted:

1. The periapical inflammation spread primarily into the interradicular region in all animals.

2. Periapical inflammation in the presence of vertical occlusal trauma caused pronounced resorption of the interradicular septum with replacement by fibrous connective tissue.

3. Periapical inflammation after pulpal involvement in teeth without occlusal trauma caused resorption of interradicular bone, which was limited to the apical level and was succeeded by highly active osteogenic repair activity.

4. Protein deprivation in animals with occlusal irritants and periapical inflammation delayed localization of the periapical infiltrate and delayed repair.

5. The response of periapical tissues to pulpal inflammation and degeneration may be altered by various local and systemic factors.

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## Clinical application of ultrasonic vibrations for supragingival calculus and stain removal

Louis R. Burman, Norman E. Alderman and Sol J. Ewen. *J.D.Med.* 13:156-162 July 1958

To determine the merits of ultrasonic vibration for the removal of supragingival calculus and stain, six patients were treated for heavy deposits of calculus and stain about the six lower anterior teeth. Two patients were similarly treated for three teeth, the adjoining three teeth being scaled with hand instruments for comparison. The following conclusions were reached:

1. There was no saving in time by using the ultrasonic device.

2. With the ultrasonic tip, calculus removal was as good as with hand instruments and stain removal was better.

3. After an initial period of apprehension, patients usually were comfortable when the ultrasonic device was used.

4. Great dexterity is necessary to use the ultrasonic tips properly; when this dexterity is achieved, operation is simple.

5. A good suction apparatus or similar device is essential. An assistant is almost as essential.

6. Tactile sensitivity with ultrasonic tips is poor. The heat developed in the shaft may annoy the operator.

7. Fatigue is minimal when the ultrasonic machine is used from time to time, but if the machine is used constantly, more fatigue is evident than with the use of hand instruments.

8. The field of vision is badly obscured when the ultrasonic device is used. Mouth mirrors are of no value at this time.

9. The type of bleedings that results from use of the ultrasonic device differs from that obtained with the hand instruments. There is more of an ooze than an actual bleeding, and the ooze persists longer than does normal bleeding.

10. Healing is normally good after use of the ultrasonic device. In two instances, tissue damage occurred.

11. Patients indicated they felt heat during the operation with ultrasonic tips. Operators reported heat in the shaft of the ultrasonic instrument.

The ultrasonic machine can be used to advantage in selected instances, but the device should not be used unless the operator has had a thorough training period in a dental school.

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Operative dentistry

### Use of an ultrasonic handpiece for amalgam condensation

Paul J. Tascher. *New York State D.J.* 24:263-266 June-July 1958

A technic for condensing amalgam with an ultrasonic handpiece appears to have several advantages.

The unit used is a small, portable, 30-watt ultrasonic generator with insert type transducers. The unit produces vibrations in the range of 25,000 cycles per second. The author uses a series of amalgam condensers with the insert type of magneto-restrictive stack. The condensers consist of inverted cone types of round pluggers of 1.5 mm., 2 mm. and 2.5 mm. diameters, and a round ball burnisher. The round faces of the condensers are smooth. Each is fitted with a tubing which returns the water necessary to cool the handpiece to a drainage line.

A conventional mix of amalgam is prepared with a mechanical amalgamator according to the usual directions. The mix is placed in a squeeze cloth and as much mercury is expressed as can be removed with pliers. This dry mixture is carried to the cavity and condensed with a conventional hand plugger until the cavity is two thirds filled. The ultrasonic amalgam condenser suitable to the size of the cavity is selected and adjusted into vibrational tune. It then is applied to the amalgam with little or no pressure. Free mercury will appear on the surface and the amalgam will be softened. The free mercury is discarded. The remainder of the amalgam is added rapidly and condensed with the ultrasonic condenser alone, until the margins are overpacked. Condensation may be carried beyond and over the margins. The resulting filling will be hard and ready for carving and removal of the matrix immediately after condensation.

A further advantage to this pressureless method of condensing amalgam is ease of immediate repair. The ultrasonic vibrational energy draws mercury to the surface of semihardened amalgam and "welds" additional amalgam to its surface. To date, fillings condensed with repairs show no difference from those completed where no repair was necessary. A technic is being investigated for the use of ultrasonically condensed amalgam fillings in temporary splinting.

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### Effect of two cementing materials on the gingival tissues

James R. Jensen and Helmut A. Zander. *North-West Den.* 37:210-212 July 1958

Recent investigations by Waerhaug and Zander (1957) showed that the poor marginal seal of restorations seems to contribute to gingival irritation. A study was undertaken to compare the effects on gingival tissues of an acrylic and a zinc phosphate cement.

Cavities were prepared in the gingival third of teeth of two dogs and one monkey. The margins extended well below the gingival tissues. The cavities were restored with acrylic inlays; ten were cemented with an acrylic cement and ten with zinc phosphate cement. In addition, ten cavities were filled with each type of cement only. Sixty days after insertion of the restorations, the animals were sacrificed and the material studied microscopically.

In the ten cavities in which inlays were cemented with zinc phosphate cement, a crevice existed on the gingival margin between the inlay and the floor of the cavity. This crevice was filled with microorganisms, debris and epithelial cells. In the cavities in which inlays were cemented with acrylic cement, crevices were not observed.

A possible explanation might be the greater solubility of zinc phosphate cement compared with acrylic cement.

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## A further investigation of the effect of cavity preparation on the human dental pulp

David S. Shovelton and Edward A. Marsland. *Brit.D.J.* 105:16-27 July 1, 1958

This paper reports a continuation of the study previously undertaken (1957), and is concerned with the effects produced on the human dental pulp by cavity preparation with tungsten carbide burs and diamond instruments at speeds varying from 8,000 to 37,000 rpm. The material consisted of 93 caries-free permanent teeth scheduled to be extracted for orthodontic or other reasons. The age of the patients ranged from 10 to 28 years. Cavities were prepared under local or general anesthesia, using either no. 558 tungsten carbide burs or diamond instruments of cylindrical or hollow-core design, 1.75 mm. in diameter. In some instances, contralateral teeth, in which no cavities were prepared, were extracted as controls. Serial sections were made of all extracted teeth.

The results support those obtained in the previous study, and indicate that considerable damage to the pulp may be caused by cavity preparation. Four factors must be considered in the etiology of this damage: (1) the traumatic effects of the bur; (2) the effect of the heat produced by the cutting instrument; (3) the influence of cavity depth, and (4) the resistance of the individual pulp.

Little pulp reaction need follow the simple cutting of dentin.

Damage to the pulp is due principally to the heat produced during cavity preparation. Pulp damage becomes progressively more severe as cutting speed is increased. This suggests that the increased damage at higher speeds is directly related to the greater heat production. A coolant should be employed at speeds in the range investigated. By the proper use of coolants, pulp damage is reduced to negligible proportions at speeds up to 30,000 rpm when tungsten carbide burs are used. Whereas it appears that the use of a cooling agent does not completely eliminate damage to the pulp when diamond instruments are used, it does reduce the damage to such an extent that complete recovery of the pulp can be expected. When a cooling device is used, it is essential that the stream of coolant reach the floor of the cavity.

The reaction of the pulp is more severe beneath a deep cavity than beneath a shallow cavity prepared at the same speed. This is probably due to the insulating effect of the greater thickness of dentin.

A pulp of a recently erupted tooth is more likely to recover completely from the effects of cavity preparation than the pulp of an older tooth.

Although the immediate response of the pulp to cavity preparation was similar with both types of instruments, the teeth that were retained for long periods after cavity preparation with diamond instruments showed pronounced changes in the odontoblastic layer. These changes appeared to take the form of a slow degeneration of these cells. The deeper pulp tissue retained its normal structure. Evidence suggests that the odontoblastic layer may be reformed and may be concerned in the formation of tubular secondary dentin.

Aspiration of odontoblast nuclei into the dentinal tubules occurred to a lesser extent when diamond instruments were used than when tungsten carbide burs were used. When aspiration did occur, it occurred most frequently in tubules on the opposite side of the pulp horn and therefore not directly involved in the cavity preparation.

No pain was experienced after cavity preparation in any teeth included in this study; this is yet another indication that absence of clinical symptoms is not a reliable indication that the pulp is healthy.

*University of Birmingham, Birmingham, England*

History

## Martin Van Butchell

H. Neumann. *Zahnärztl.Mitt.* 46:336-338
May 1, 1958

Martin Van Butchell was born on February 7, 1735, in London. He studied anatomy and surgery under William and John Hunter, practiced medicine for a short time and opened a dental office in 1760.

The February 7, 1769, issue of the *St. James's Chronicle* carried the following advertisement:

"ARTIFICIAL TEETH! Any number of, from one to an entire set, with gold springs, on new principles. Gums, sockets and palates formed, finished and fitted (not causing pain) so accurately as to answer every purpose without being felt. Imperfections are covered with useful ornaments most helpful to enunciation, mastication, etc. The Nobility and Gentry, sending written timely notice, shall be punctually waited on and the profoundest secrecy observed by M. Van Butchell, Upper Mount Street, Grosvenor Square, who (neither goes journeys nor gives credit) aims and is acknowledged to excel in performing the various operations, after methods and with instruments peculiarly his own, invented or improved through a series of close applications, expensive studies and much experience.

"At home every day, from nine till three, Sundays except.

"Advise is freely given, and specimens are shown.

"Mr. Van Butchell having made all his patients happy hopes discerning minds, when others cannot please, will apply to him who cures toothache and with care prepares everything expedient, innocent, yet efficacious, to cleanse, recover and preserve the gums and teeth."

In another advertisement (1775), he stated that he confined his practice to "disease, deformities and defects of the teeth, gums, sockets and palates and that his friends, the Noble, the Generous and the Discerning all welcomed."

An enlightening advertisement appeared in the *St. James's Chronicle* of March 1, 1777:

"MARTIN VAN BUTCHELL, Surgeon-Dentist, attends at his house, upper part of Mount Street, Grosvenor Square, every day in the year, from nine to one o'clock, Sundays excepted.

"Name in marble on the door. Advise . . . £2″1; taking out a tooth or stump . . . £1″1; putting in artificial teeth . . . £5″5 each. A whole under row . . . £42, upper row . . . £63. An entire set £105. Natural teeth . . . £10″10 each. The money paid first."

The sum of 105 British pounds for a set of dentures always has been a considerable amount.

James Snell, a member of the Royal College of Surgeons of England and the author of several dental textbooks, referred to Van Butchell as follows: "It is not generally known that, amongst the number of his occupations, Martin Van Butchell was a good dentist, as a mechanic particularly."

Although somewhat unbalanced, Van Butchell's advertisements seldom failed to arouse public interest, sometimes hilarity. He seems to have preferred to attend to the physical and dental ailments of the British nobility. His various claims, however, cannot be disregarded. A contemporary writer who had conversed with many of Van Butchell's patients stated that they considered themselves fortunate to have been under Van Butchell's care and that he was able to turn despair into joy.

In spite of his tactics, pursued throughout many years, both as a dentist and physician, he never was sued for malpractice. Such immunity from legal actions is remarkable because he had been an extremely busy practitioner whose name was anathema to most contemporary dentists, physicians and surgeons.

Van Butchell died in 1814. His tomb in the cemetery of the St. George Church is one of the attractions of the Old Baywater Road in present-day London.

Some of the data published are based on J. Menzies Campbell's biography, *Martin Van Butchell, 1735-1814, the Eccentric Dentist of Mount Street.*

*Reuterstrasse 6, Nürnberg, Germany*

### Royal Dental Hospital and School

*Brit.M.J.* No. 5083:1351-1363 June 7, 1958

On June 3, 1958, the Queen opened the extension to the Royal Dental Hospital of the London School of Dental Surgery.

The Royal Dental Hospital of London was opened on December 1, 1858. On October 1, 1859, there came into existence at the hospital the London School of Dental Surgery. This was the first dental school to be opened in Great Britain with facilities for practical instruction and the acquisition of clinical experience. The hospital and school owed their being to the founders of the Odontological Society of London, which was established on November 10, 1856, to rescue dentistry from the chaos into which it had fallen at that period. The general standard of dental practice was extremely low. The extraction of aching teeth was all that dentistry comprised in the minds of the public. Extractions commonly were carried out by blacksmiths, tinkers, chemists and druggists, cuppers, chiropodists and itinerant quacks. Even those who had served some sort of apprenticeship practiced dentistry on tradesman-like principles, issuing blatant advertisements and writing their names on their shop fronts in letters made of decayed teeth.

The task which faced the founders of the Odontological Society was nothing less than the creation of a dental profession with defined standards of education, training and ethics.

The select band of reformers who succeeded in raising dentistry from a trade to a profession included Sir John Tomes, Sir Edwin Saunders, W. A. Harrison, Arnold and Thomas Rogers, the two Samuel Cartwrights, and several members of the Parkinson dental dynasty. It was due to these men, and to Tomes's friend, James Moncrieff Arnott, that a curriculum and a dental license were established under the aegis of the Royal College of Surgeons.

On July 5, 1948, when the National Health Service Act came into force, the Royal Dental Hospital became part of the St. George's Hospital group, and the school was incorporated as an autonomous body.

The Queen's visit marked the beginning of the centenary celebration of the hospital and school. After a tour of the hospital departments, the Queen went to Orange Street to unveil a commemorative tablet in the school's new extension, inspected the building, and took tea in the new library with the assembled guests. The extension comprises a lecture theater for 70, teaching and research laboratories and animal rooms, library, students' common room and offices.

*British Medical Association, Tavistock Square, London W.C.1, England*

### Medicine and dentistry in precolonial eras. Historical considerations

Ernesto Cohn. *Rev.A.odont.Argentina* 45:439-441 Nov. 1957

The civilization and culture of the Aztecs, Mayas and other Indian tribes of the region that at the present time constitutes Latin America were at high level when the Spanish conquerors invaded the American continent. Culture was brought to the Indians when Asiatic and African people migrated through the Bering Strait into America and intermarried with the Indians.

Medicine and dentistry were greatly developed in the precolonial period. According to translations of Indian manuscripts and books into Spanish, subjects of murals recently discovered in Teotihuacán, México, and instruments (trephines) found in Aztec and Mayan pyramids, the Indian physicians had a thorough knowledge of anatomy, internal medicine, dentistry and surgery. Some of them specialized in treating fractures and luxations. They knew trephination and hydrotherapy, including vapor baths followed by massage.

Both the teaching and the practice of medicine and dentistry were mixed with religious and superstitious beliefs. The Indians used roots, leaves, flowers and fruits of certain plants with anodynic, inebriating, narcotic and other therapeutic properties, according to the appropriate indications. Plants with therapeutic properties were cultivated in large botanical gardens in Mexico and in Central America. At that time there were no botanical gardens of medicinal plants elsewhere in the world. Some Indians used the poison of snakes or ground the teeth of pumas for therapeutic purposes. Both medicine and dentistry were social services. Extracts of medicinal

plants were given to all people, from the king and the high clergy to the poor. Dentists had the duty of treating any patient who applied, regardless of his social or economic situation. A few of the medical or dental treatments of the Indians are still used by laymen in certain regions of Latin America.

Indian dentists had knowledge of the anatomy of the pulp and were able to prevent injury or irritation to the pulp during dental treatment. They were expert in performing extractions. They expressed the belief that dental caries was due to minute worms. It is interesting to observe that this is the same belief that prevailed in the Middle Ages in Germany, according to the book of the nun Hildegard von Bingen. Indian dentists used lemon juice for the treatment of scurvy, huisache (an astringent plant) for inflammation of the gingiva, saltpeter for toothache, and many other natural materials. Most Indian tribes chewed herbs that prevented caries. Except among some tribes living far from Spanish civilization, this habit disappeared after the settlement by the Spanish conquerors.

Today there are groups of Indians (the Jíbaros) who live in the eastern forest of Ecuador with no contact with civilization. They chew a plant which relieves toothache. The plant loosens the carious tooth in the alveolus and heals the surrounding tissues so that the tooth can be pulled out a few days later by the patient, with his fingers, without pain or discomfort. The Jíbaros know, as well as the Aztecs knew, a plant which when chewed gives the teeth a dark or black color and prevents caries. This plant is the subject of recent studies in some German laboratories. It is hoped that the results of this study may help dentists in solving the problem of the prevention of caries.

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## Histology

### Study on structure around dentinal tubule

Kazunari Yamamoto. *Bul.Oral Path.,Tokyo* 2:1-18 Nov. 1957

There have been two major views on the nature of the structure around dentinal tubules: one is that the circular layer around the dentinal fiber is a matrix; the other is that the space is merely an artificial formation. A study of the structure around the dentinal fiber was made by various methods. The material consisted of specimens prepared from the dentin of the horse, elephant and giraffe. Both ground sections and replicas were prepared and observed by ordinary or phase microscopes.

The major conclusions were as follows:

1. The circular zone around the dentinal fiber indicates the existence of a particular matrix in that part. (The structure is called "peritubular matrix," the term given it by Takuma.)
2. The peritubular matrix is more highly calcified and less fibrous than the intertubular matrix.
3. The fibrils in the peritubular matrix are arranged as in fretwork.
4. The peritubular matrix is easily destroyed by demineralization, although this process has little influence on the shape and size of the matrix.
5. It can be presumed that the peritubular matrix and the intertubular matrix have a bordering structure between them.
6. The size and shape of the peritubular matrix vary considerably. It is big near the enamel but tends to become smaller near the pulp cavity.
7. The peritubular matrix also can be observed around the branches of the dentinal tubules, although its diameter is much smaller than that of the peritubular matrix around the main tubules.

*Tokyo Dental College, Tokyo, Japan*

## Endodontics

### Arch continuity through endodontics

C. E. Rudolph, Jr. *Mil.Med.* 122:385-389 June 1958

In no other healing art is such a small "ounce of prevention" worth such a large "pound of cure" as in dentistry. And no other tool of preventive dentistry is as valuable as is endodontics. Endodontic therapy can: (1) obviate the need for fixed or removable dentures or for complete dentures in many instances; (2) often prevent arch disintegration and obviate the need for orthodontic treatment; (3) eliminate much unnecessary expense to the patient; (4) prevent much emotional trauma, particularly that following the extraction of anterior teeth; (5) promote good health rather than foster focal infection, and (6) quickly find its rightful status as a major weapon in the arsenal of the practicing dentist.

It is shortsighted arbitrarily to extract a tooth in which only the pulp has died. The primary function of the pulp is to "grow the tooth." Once this is accomplished, the pulp serves as little more than an alarm system for its own protection—hardly an essential function. Elimination of the nonfunctional pulp or pulp fragments and obliteration of the root canal under aseptic conditions allow the retention of the treated tooth. Endodontic therapy, by obviating the need for extraction of a tooth, makes unnecessary its replacement, with attendant involvement of adjacent teeth. If the crown of the tooth has been lost, frequently the root can be treated and filled so that a restoration with dowel may be placed. As a result of more adequate endodontic procedures, one can anticipate a resurgence of the art of making Davis or Richmond crowns.

Possibly the most valuable service which the endodontist can perform is the prevention of that first interruption in the continuity of the dental arch, which often is followed by the migration of the adjacent teeth.

At the Naval Dental School, several methods of root canal decontamination and at least three root-filling technics are used. The operator must evaluate the pulp condition, anatomy of the tooth, anatomy of the surrounding structures, health of the patient, attitude of the patient towards the treatment, and the strategic value of the tooth in question.

*U. S. Naval Dental School, Bethesda 14, Md.*

### Significance of findings following biopsy and histologic study of 100 periapical lesions

F. T. Wais. *Oral Surg.,Oral Med.& Oral Path.* 11:650-653 June 1958

This study was conducted in two stages on 100 anterior teeth with nonvital pulps and periapical lesions. Root surgery was instituted only after attainment of two consecutive negative cultures and proper obturation. All surgically enucleated tissues were submitted to an oral pathologist for histopathologic study. A diagnosis of "cyst" was determined histologically only in material which contained a central lumen lined with epithelium.

The first 50 lesions from which biopsy specimens were taken had been diagnosed as cystic on the basis of dental roentgenograms. Histopathologic study showed that 13 of the 50 (26 per cent) were cysts and 32 (64 per cent) were granulomas. In the second stage of the study, it was decided to operate on 50 teeth with nonvital pulps, having any type of pathologic lesion, and to determine the percentage of cysts present by microscopic study of the tissue removed. Of the 50 lesions, 42 (84 per cent) were granulomas and 7 (14 per cent) were cysts.

This study further substantiates the belief that periapical lesions cannot be diagnosed as cysts by means of roentgenography alone. The majority of lesions observed at the apexes of teeth with nonvital pulps in this study were granulomatous rather than cystic. The dentist who employs accepted scientific endodontic procedures and then routinely performs curettage or apicoectomy on teeth with nonvital pulps and periapical lesions is performing root surgery unneces-

sarily in most instances. With patients who can be recalled routinely, the conservative treatment of teeth with nonvital pulps and periapical lesions is warranted in most instances. An ideal procedure would be to recall the patient periodically for roentgenographic checkups after completion of the root canal treatment.

*U.S. Naval Training Center, Great Lakes, Ill.*

### The electric vitality tester—principles and construction

Alex Dinin. *J.D.Med.* 13:163-165 July 1958

In diagnosing teeth for abnormalities of the pulp, the dentist relies on the patient's history, the roentgenogram and the pulp tester. The readily available 60 cycle current is adequate for pulp testing. An electric vitality tester should indicate that current is passing through the tooth and is reaching the nerve, and should provide a record of the amount of current required to elicit a response. The record should be in terms of a numerical value which represents the condition of the pulp. In any future repetition of the test, a change in the numerical value indicates a change in the condition of the pulp.

In pulp testing, a circuit is created consisting of the machine, the patient and the tooth. These form, in effect, a series of resistances. In any circuit, amperage remains constant throughout the circuit, but voltage may vary at different points because of the different resistances present.

When, in testing the vitality of a pulp, a response is elicited, a recording of amperage shows how much current in the pulp cavity was required to elicit this response. A recording of the voltage tells how difficult it was for the current to get through the enamel and dentin to stimulate the pulp. Vitality responses are recorded with an ammeter.

These principles have been incorporated in the construction of an electric vitality tester which has been in use for six years in the department of endodontia at the New York University College of Dentistry. Reliability of the tester has been proved by the correlation between its tests and the condition of the pulp as noted during endodontic treatment. Pulp responses are read on a microammeter. The circuit develops a current in microamperes, since only a minute amount of current is required to stimulate a nerve at its threshold.

*57 West 57th Street, New York 19, N. Y.*

### Endodontic treatment with a zinc oxide-Canada balsam filling material

Donald L. McElroy and Edward C. Wach. *J.A.D.A.* 56:801-806 June 1958

A zinc oxide-Canada balsam root canal filling preparation was formulated by Wach and has been used in the clinics of the College of Dentistry, University of Illinois, and by other dentists, for about 30 years. The composition of this material is as follows: powder: zinc oxide, 10 Gm.; calcium phosphate, 2 Gm.; bismuth subnitrate, 3.5 Gm.; bismuth subiodide, 0.3 Gm.; heavy magnesium oxide, 0.5 Gm., and liquid: Canada balsam, 20 cc., and clove oil, 6 cc.

Six case reports are presented. The usual endodontic procedure was followed. In the series of patients treated, radiolucent regions were resolved and there was complete resorption of both the plastic filling material and the gutta-percha points in those instances in which there had been pronounced overfilling of the root canal. The process of resorption seems to cease when the filling material has been resorbed to the apex of the root. Earlier healing and resorption took place in younger patients.

The six case reports demonstrate that, when the filling material has adequate access to the root apex, usually there is no need to correct apical radiolucent regions by surgery.

*College of Dentistry, University of Illinois, Chicago, Ill.*

### Histopathological study on healing of periapical tissues after infected root canal treatment of human teeth

Kazuhiro Kukidome. *Bul.Oral Path.,Tokyo* 2:65-87 Nov. 1957

In 1933 the laboratory of oral pathology at the Tokyo Dental College started an experimental

study concerning pulp and root canal treatment. The study has been going on for 25 years; 6,665 teeth of 648 dogs have been used, and 128 kinds of drugs have been tested. Although the study has produced many valuable findings, progress has been slow in developing a treatment for infected root canals and in verifying the studies clinically on human patients.

The author treated many infected root canals of clinical patients, by various methods, later removing the periapical tissues for histologic study. The materials were obtained from 55 patients ranging in age between 15 and 62 years. Each infected root canal was sterilized from two to eight times, filled with drugs, closed with amalgam, and left for periods of from 8 to 397 days. The periapical tissues with a portion of the root apex were scraped out by a routine method of root apex excision, fixed, sectioned, stained and studied histologically. Roentgenograms of the infected teeth were taken before the root canal treatment, before and after the root canal filling, and before excision of the apex.

The healing process observed in the periapical tissues may be classified roughly as: (1) diminution and healing of apical periodontitis; (2) regeneration of the periapical tissues destroyed by inflammation or trauma during treatment, and (3) closure of the apical foramen.

The healing process after treatment of apical periodontitis follows the same lines as the natural healing process which occurs without treatment. However, the drugs and filling materials used in treatment hasten the healing.

The main changes in the process of regeneration of the periapical tissues are: (1) repair of the absorbed tooth root; (2) proliferation of the alveolar bone; (3) regeneration of the periodontal membrane between the repaired root surface and the proliferated alveolar bone, and (4) reformation of the periodontal space. In some instances, however, because of poor proliferation of the alveolar bone, the region destroyed by inflammation remains occupied for a long time only by loose connective tissue.

Closure of the apical foramen may be classified according to its position as follows: (1) closure inside the root canal; (2) closure at the apex, and (3) closure outside the apex. Closure also may be classified according to the kind of closing tissue, as (1) closure by dense fibrous connective tissue and (2) closure by proliferated cementoid or osteoid tissues.

Closure of the apical foramen is a protecting function, preventing an inflammatory stimulus from reaching the periapical tissues through the opened root canal. Such closure accompanies the healing of the inflammation and regeneration of the periapical tissues.

There are five basic types of perfect healing after these processes: (1) formation of the cicatrized root canal polyp; (2) perfect encapsulation of the filling material projecting from the apex by the fibrous connective tissues; (3) "natural" closing of the apical foramen due to newly grown cementoid or osteoid tissues; (4) filling of the focus by healthy fibrous connective tissue or marrowlike, coarse connective tissue, and (5) active regeneration of the alveolar bone. Each of these basic types of healing may occur alone or in combinations of two or more.

There is no basic difference in form between healing of the periapical tissues in an infected root canal of a clinical patient and in an experimentally infected root canal of a dog.

The most important factor in bringing about quick and complete healing is the biological influence of the filling material in promoting natural healing of the periapical tissues. No significance was noticed in the differences in age and sex of the patient, kind of tooth, method and frequency of root canal sterilization, or period of time elapsed after treatment.

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## Anesthesia and analgesia

### Dyclonine in general dental practice

J. Harold Thomason.
*J.South.California D.A.* 26:242-243
July 1958

In the past 18 months the author has used a 0.5 per cent solution of dyclonine hydrochloride 1,224 times as a topical anesthetic, as follows: mental injections, 116; mandibular injections, 436; infiltration, 632; extraction of deciduous teeth (no infiltration anesthesia), 15; scaling by hygienist, 12; lancing abscess, 8, and control of gagging, 5.

The solution was uniformly effective and safe. Before infiltration or nerve block, a cotton pellet saturated with dyclonine was placed over the region to be injected for three minutes. For the removal of deciduous teeth without injection, half a cotton roll saturated with the solution was held over the area, or the area was swabbed several times. Before scaling, the dental hygienist swabbed the gingival margins several times. If an abscess was to be lanced, a saturated cotton roll was placed over the area for from three to five minutes. Gagging was controlled by having the patient swish and gargle a teaspoonful of dyclonine.

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### Anesthetic emergencies in the dental office

Leonard M. Monheim. *J.Michigan D.A.*
40:158-164 June 1958

Anesthetic emergencies in the office of the general dental practitioner are uncommon, but not rare. Every dentist should acquire sufficient knowledge to recognize and treat the emergencies inherent to his type of practice. The emergencies most likely to occur during or following the use of local anesthetics fall in two categories: (1) those attributed to insertion of the needle, and (2) those attributed to the solutions used.

Emergencies attributed to the insertion of the needle are fainting and needle breakage. Fainting is the most common emergency in the dental office. Although the sudden loss of consciousness represents the most dramatic symptom of fainting, this is not the only or the earliest manifestation. In most instances, the patient first will complain of feeling "faint." Complete loss of consciousness may be avoided if the patient's head is lowered below the level of his body. Oxygen, which should be available in every dental office, should be administered. In most instances, fainting can be avoided if the dentist considers the patient's mental attitude and his susceptibility to psychic trauma.

When a needle breaks during injection, immediate action is necessary to prevent the situation from becoming more serious. The patient should not be alarmed, for if he becomes excited he may close his mouth and initiate muscular movements which may cause the needle to be drawn out of sight into the tissues. A suitable instrument for grasping the needle should be readily available at all times.

Emergencies attributed to the anesthetic solutions used are toxicity, idiosyncrasy, allergy and anaphylaxis.

The early symptoms of toxic overdose are primarily those of central nervous system stimulation. In most instances, the manifestations of a toxic overdose are immediate, mild and transitory, and no specific treatment is needed. If treatment seems warranted, a barbiturate should be administered intravenously until the stimulating phase is controlled. Should the patient have a toxic reaction to a vasoconstrictor, he should be given oxygen as well as small doses of intravenous barbiturates, if the reaction persists. Fortunately, such reactions are of brief duration.

An idiosyncrasy may be defined as a hypersensitivity to a drug which results in bizarre reactions. The dentist should observe all patients after the injection of a local anesthetic so that he may diagnose accurately any untoward reaction requiring emergency treatment.

Drug allergy may be defined as a hypersensitivity to a specific drug or chemical agent. The skin, mucous membrane and blood vessels may

be the shock organs, and the reactions may be manifested by asthma, rhinitis, angioneurotic edema, urticaria and other skin rashes. When a patient exhibits an allergic reaction to a specific drug, the dentist should write down the name of the drug for the patient so that he may acquaint any other dentist or physician with this knowledge. When a patient gives a history of drug allergy, this must be accepted as a fact until proved otherwise. To doubt such a history may invite serious trouble. For immediate treatment of allergic reactions, diphenhydramine hydrochloride in dosages of 20 to 40 mg. may be administered intravenously or intramuscularly. Epinephrine hydrochloride may be administered intramuscularly or subcutaneously in dosages of 0.3 to 0.5 ml. Epinephrine sulfate, 0.25 mg., also may be given orally.

Anaphylactic reactions are an allergic manifestation in which a sudden violent loss of vasomotor tonus is exhibited. Respirations rapidly may become inadequate, and death may occur. Fortunately, such a reaction is rare.

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### Cyclopropane in non-explosive mixture for out-patient anaesthesia

William W. Mushin and Peter W. Thompson. *Brit.M.J.* No. 5084:1376-1378 June 14, 1958

The commonest anesthetic for minor operations in Great Britain is nitrous oxide. Inexpert administration often results in hypoxia. The fundamental disadvantage of nitrous oxide is its low anesthetic potency; an attempt to deepen anesthesia inevitably introduces hypoxia.

Cyclopropane is an anesthetic with desirable qualities, since its potency allows complete oxygenation, and the speed of induction and recovery is attractive for ambulant patients. An important drawback to cyclopropane is its flammability and the risk of explosion. Newton-Andrews (1954) observed that sparks were easily and frequently produced when, in the course of a dental extraction, the forceps slipped on the enamel of a tooth. These sparks easily ignite mixtures of certain proportions of cyclopropane and oxygen. Cyclopropane therefore cannot be accepted for dental anesthesia unless it is administered in a nonexplosive mixture. Such a mixture may be made by the addition of a suitable diluent gas, such as helium or nitrogen. Hingson (1954) developed and described a simple portable inhaler which used midget cylinders (similar to the "Sparklet" bulbs used for making soda water at home). Later, Hingson selected a nonexplosive mixture, for clinical use, of 30 per cent oxygen, 40 per cent cyclopropane and 30 per cent helium.

The authors have experimented with Hingson inhaler and found that it contributes to more efficient and perhaps safer short anesthesia for dental and minor surgery. It prevents hypoxia without introducing the explosion hazard usually associated with the use of cyclopropane.

The Hingson apparatus (the Western Reserve University portable anesthesia machine) was used to produce anesthesia in more than 100 patients. Consciousness was lost within 15 to 30 seconds. There were no complaints of difficulty in breathing during the induction. In from 45 to 90 seconds, surgical anesthesia was established. The signs were regular breathing, relaxation of the limbs and jaw, disappearance of the lid reflex, and, in dental patients, lack of any response to mouth packs. In a few instances, transient coughing occurred after consciousness had been lost but before surgical anesthesia was established. The coughing was not pronounced and did not last for more than two or three respirations.

In dental patients inhalation was continued for a time after anesthesia was established. Generally, if was found that a period of two to three minutes of inhalation provided at least one minute of perfect operating time after the mask was removed. This period could be extended considerably by the nasal administration of nitrous oxide and oxygen. Bleeding and salivation were sometimes a little freer than is usually seen with nitrous oxide anesthesia. Most patients recovered consciousness in from one to one and a half minutes after discontinuance of administration. In the dental operations, the dentist was able to complete the procedure before the patient recovered consciousness. After recovery of consciousness and of reflexes, some drowsiness and giddiness often persisted for up to ten minutes.

Most patients required assistance in walking away from the dental chair. Nearly 10 per cent of the patients vomited in the immediate post-anesthetic period. None vomited during anesthesia. The vomiting was slight, but its frequency was higher than was experienced with nitrous oxide and oxygen.

The method of inducing anesthesia with the Hingson inhaler is effective and satisfactory for operations which can be completed within about five minutes. It seems to be of special value in two types of patients: those in whom an episode of hypoxia would be particularly dangerous, and those robust and "resistant" patients in whom difficulty with nitrous oxide can be anticipated. The chief disadvantages of the method are the slightly higher incidence of vomiting, and the slightly longer time required for the patient to recover enough to be allowed to walk unaided.

*Royal Infirmary, Cardiff, Wales*

### A comparison of thiopental sodium, methitural sodium, and methohexital sodium in oral surgery patients

Charles H. Redish, Robert E. Vore, Stanley M. Chernish and Charles M. Gruber. *Oral Surg.,Oral Med.& Oral Path.* 11:603-616 June 1958

A comparative double blind study of three anesthetic agents was made in 71 oral surgery patients selected from the out-patient dental clinic of Indianapolis General Hospital. Thiopental sodium 2.5 per cent, methitural sodium 5 per cent, or methohexital sodium 1 per cent, was administered. The following conclusions were reached:

1. Doses of 135 mg. of methohexital sodium, 765 mg. of methitural sodium and 410 mg. of thiopental sodium are about equal in potency.

2. Recovery from methohexital sodium is significantly more rapid than from comparable doses of methitural sodium or thiopental sodium. No significant difference in recovery from methitural sodium and thiopental sodium was noted.

3. The heavier the patient, the more anesthetic is required.

4. Jactitations were noted on 3 of 24 administrations of methohexital sodium. The two patients experiencing this reaction had grade I dysrhythmia on electroencephalographic examination.

5. An elevation in blood pressure occurred during induction with all three anesthetics, but was most pronounced with thiopental sodium. The blood pressure returned to normal during the recovery phase.

*School of Dentistry, Indiana University, Indianapolis, Ind.*

### Hypersensitivity to procaine

H. R. Sullivan. *Australian D.J.* 3:187-188 June 1958

A 56 year old woman attended the United Dental Hospital for the removal of six anterior teeth. The teeth were extracted under procaine hydrochloride anesthesia. Six weeks later the patient returned for the removal of some maxillary and mandibular molar roots; again, procaine hydrochloride was used to obtain local anesthesia. The patient was instructed to return for surgical dressing on the following day. Twenty-four hours after the operation, the patient had developed a rash over her cheeks, neck and the exposed portion of the chest. She complained that she had been unable to sleep because her face was throbbing and swollen. She then reported that a similar reaction occurred after the previous extractions.

The patient was referred to the Institute of Dental Research. Scratch tests were carried out for 2 per cent procaine and 2 per cent lidocaine hydrochloride. At the end of half an hour there was no reaction. After 24 hours, however, there was a reaction to the procaine; swelling, inflammation, induration and irritation occurred. The patient asserted that wherever the procaine touched her skin, a reaction occurred. She stated that some procaine had dripped from the syringe on the napkin covering her chest, and that irritation had developed in that area and had lasted for nearly two weeks.

A small amount of 2 per cent procaine was applied to the skin of the forearm without first having made any scratches. Within 48 hours a pronounced reaction developed, which lasted for about two weeks. The area was itchy, and a rash appeared on the upper arm and on the side of

the body where the forearm had come into contact with them.

The patient was deemed to be hypersensitive to procaine. Subsequent dental procedures were carried out under lidocaine hydrochloride anesthesia with no untoward effect.

*2 Chalmers Street, Sydney, Australia*

### Recently introduced local anesthetics and their effect on the blood pressure

P. Adler and L. Koscár. *Anaesthesist,Berlin* 7:129-130 May 1958

The possible hemodynamic pressor response, initiated by local anesthetic solutions, is of particular importance to the dentist if the patient to be anesthetized suffers from heart disease or hypertension. The majority of accidents during or immediately after local anesthesia in dental practice result from the sudden fall of blood pressure produced by epinephrine.

Hypersensitive and excitable patients—sometimes called "allergic"—frequently exhibit a postanesthetic syndrome consisting of emotional disturbance, increased palpitation, tremor and perspiration when local anesthetics are administered.

Several new local anesthetics are offered to dentistry every year. The effect on the blood pressure of five new local anesthetics was investigated at the Dental School of the University of Debrecen, Hungary. The blood pressure response to (1) Oxyprocaine (Hoechst); (2) Chloroprocaine (Leuna); (3) Xylocaine (Astra), (4) Hostocaine (Hoechst) and (5) Falicaine (Fahlberg-List) was tested. Ten dogs were used in the experiment and 2 per cent solutions, with and without epinephrine, were injected.

These five local anesthetics, with an anesthetic potency far higher than that of procaine hydrochloride, caused a severe drop in blood pressure. In concentrations of equal effectiveness, the systemic toxicity was less noticeable than if 2 per cent solutions of procaine hydrochloride with an appropriate concentration of epinephrine were used. In a few instances, the untoward effects of the new local anesthetics were almost identical with those occurring when procaine hydrochloride was utilized.

Although the results of this investigation cannot be applied indiscriminately to local anesthetics used in dental practice, they indicate that none of these new local anesthetics possesses properties which offer basic advantages to dentistry. Because of its negative effect on the blood pressure, Falicaine seems to be even less suitable for dental practice than the other four local anesthetic agents tested.

*Stomatologische Universitätsklinik, Debrecen, Hungary*

### Cooperation between the obstetrician and dentist

Bruce L. Douglas. *J.Am.D.Soc.Anesthesiology* 5:19-20 May 1958

Occasionally there is a lack of understanding between obstetricians and dentists about the anesthetic management of pregnant women. General anesthesia usually can be avoided in the dental treatment of the pregnant patient. Occasionally, however, a pregnant patient may be unable to tolerate local anesthesia. Some obstetricians do not realize the importance of general anesthetic technics in dental practice. One effective method of eliminating fear and pain is through the use of preanesthetic medication followed by nitrous oxide-oxygen analgesia (with percentages of oxygen exceeding 50 per cent), and the injection of a local anesthetic while the patient is under analgesia.

Undue stress, particularly during the first trimester of pregnancy, can cause congenital abnormalities in the developing fetus. Fear itself is a stressful situation and should be eliminated if possible. An analgesic technic utilizing high percentages of oxygen is an effective and useful means of treating these patients in the dental office. Obstetricians should be educated to understand and accept these facts. Many obstetricians, justifiably concerned with the dangers of hypoxia, instruct their patients not to have general anesthesia; unfortunately, they tend to include analgesia in the same category.

The obstetrician and the dentist should confer before the pregnant woman undergoes dental treatment.

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Hospital dental service

**Periodontia residency program in a university affiliate hospital**

Irwin Walter Scopp. *Mil.Med* 122:399-404 June 1958

Hospital residency programs in periodontics are new and represent a break with tradition. Among the benefits of such a program are the following:

1. The patient receives a more comprehensive dental service since the entire dental staff becomes better trained and more alert.

2. The periodontal health of the patient receives fuller attention.

3. The resident, performing on patients, contributes to the over-all output of the clinic. At least 60 per cent of his time is spent treating patients.

4. The program forms an important bridge to the community, to the dental profession and to the university.

5. The training of the medical resident and of other physicians at the hospital is advanced.

During a two year period the hospital resident in periodontics is taught at the hospital and at the university the following subjects: anatomy, physiology, biochemistry, and pathology of the gingiva, the periodontal membrane, the cementum and the alveolar bone. These are related to daily clinical practice. Gingival diseases caused by local factors and systemic factors are evaluated. Manifestations of dermatologic diseases in the oral cavity are studied. The clinical aspect and histopathology of the various periodontal pockets are related to the basic disease factors. The etiologic factors in periodontal disease are stressed. The role of calculus, microorganisms, traumatic occlusion, food impaction, malnutrition, malocclusion, restorative dentistry, endocrine and hematologic diseases and their influence on periodontal disease are integrated clinically. Related to this are diagnosis, treatment planning, instrumentation, pocket eradication, oral function, pharmacology, prognosis and rehabilitation. This activity is coordinated in the dental service, where the resident spends at least 60 per cent of his time during eight months of the school year and all of his time for the remaining four months.

The hospital program should be a progressive educational experience adapted to the professional requirements of the resident. It should prepare him for specialized private or hospital practice, for research and for teaching. It should be flexible enough to meet the resident's requirement for postgraduate university and hospital training.

In our hospitalized population, periodontal disease is rampant. A virile program for its control, treatment and elimination will result in a more comprehensive health service and speedier recovery. A residency program in periodontics is one way of focusing attention on the problem of improving the periodontal health of the hospitalized patient.

The resident should explore more than one technic, so that he can evaluate the advantages and disadvantages of all procedures, and use the one that best meets his objective.

One way to provide the resident with a sense of belonging is to provide him with a good, competent dental assistant. As funds become available, the resident should be asked if there are any materials or instruments he would like to order or any additions to the medical library that he would wish. Care should be taken to see that the resident's quarters and meals are up to par, that he is receiving proper cooperation from the other hospital personnel, that the other medical services are working with him, that the university training is meeting his needs, and that teaching assignments are available in the undergraduate clinic of the dental school. Good residency programs in periodontics have to be planned and supervised carefully.

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## Bacteriology

### In vitro calcification of dental calculus

Bernard H. Wasserman, Irwin D. Mandel and Barnet M. Levy. *J.Periodont.* 29:144-147 April 1958

Mandel and others (1957) found that when celluloid strips were placed around the lower anterior teeth of patients in whose mouths calculus formed rapidly, calculus was deposited on the strips.

In the present experiment, celluloid strips with adherent precalcified bacterial plaque were inserted into a modified calcifying solution, to permit study of calculus calcification in vitro. Strips with adherent bacterial plaque were removed from the mouth after 55 to 60 hours and suspended in a calcifying solution for from four to six days at 37°C. The strips showed evidence of calcification by the fourth day. This could be demonstrated by soft roentgenograms of the strip, by staining the strip with alizarin red S, and by preparation of histologic sections stained with von Kossa's silver nitrate stain. The apatite formed was similar to that found in bone, teeth, and salivary calculus formed in the mouth. Pieces of skin, lip, mucous membrane and tongue suspended in the calcifying solution for six days did not calcify, indicating that tissues which do not calcify in the body will not calcify in vitro under the conditions of the experiment.

Treatment of the strip with adherent bacterial plaque with 10 per cent neutral formaldehyde solution for 15 minutes did not affect its ability to calcify. Colonies of *Actinomyces israeli* suspended in the calcifying solution showed considerable calcification. The addition of testicular hyaluronidase at this concentration level had a pronounced inhibitory effect on the amount of calcification; this inhibition indicates the presence in bacterial plaque of substances labile to hyaluronidase which have the ability to combine with calcium in vitro. It is not possible to identify the chemical substance affected by the hyaluronidase since the spectrum of activity of this type of hyaluronidase is broad. In all probability, however, it is a carbohydrate moiety usually found associated with protein. The authors previously (1957) pointed out similarities between salivary calculus and other calcifications, especially as regards the presence of carbohydrate proteins. These carbohydrate protein complexes may be a part of the "local factor" determining calcifiability of a tissue.

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### The availability of bacterial growth factors in human gingival tissue

T. A. Nevin, M. D. Appleman and H. M. Kurtz. *J.D.Res.* 37:427-431 June 1958

In a continuing study of the availability of bacterial nutrilites in the mouth, the role of the gingival mucosa in supplying such materials to its indigenous microflora was investigated. Samples of inflamed human gingival tissue were compared with samples of noninflamed human gingival tissue, with respect to activities measurable as niacin, riboflavin, biotin and pantothenic acid. An auxanographic method was adapted for the microbiologic assay of growth factor activity in such tissues.

The existence of a complex microflora, such as that of the mouth, must ultimately depend on a continuing supply of essential nutrilites. Cellular debris, derived from host tissue, probably supplies appreciable amounts of such compounds. The occurrence of vitamins or vitaminlike compounds in gingival tissues and in bacterial growth factor forms may reflect storage of these materials by the tissue cells. Thus, these materials would be available for cellular nutrition and, by extension, for bacterial nutrition.

In general, noninflamed tissue samples assayed higher than inflamed tissue samples in their content of riboflavin, niacin and biotin. The pantothenic acid content of both types of tissues was essentially the same. The noninflamed tissue samples assayed negatively with greater frequency than did the inflamed tissue samples.

The differences in growth factor activity between inflamed and noninflamed gingival tissue have no explanation thus far.

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Physiology

### The relation of salivary glands to certain endocrine glands

J. F. Volker. *J.D.Med.* 13:125-129 July 1958

Investigations that suggest the complex relationship between the salivary glands and a number of the endocrine glands are seldom reported in the dental clinical literature. Such researches are increasing. From the accumulated findings the following tentative conclusions can be drawn:

1. A relationship exists between the salivary glands and certain endocrine glands, particularly the gonads and the thyroid gland, and possibly the adrenal glands.

2. In rodents a dimorphism of the salivary glands has been noted that distinguishes males from females. These characteristics can be reversed by the administration of appropriate sex hormones.

3. Under certain conditions the removal of the gonads brings about structural changes in the salivary glands.

4. Many observations in human subjects support the theory of a relationship between the salivary glands and the gonads.

5. The salivary glands are under the intimate control of the thyroid gland. Thyroidectomy causes structural alterations in the salivary gland and reduces salivary flow. Comparable changes occur with thiouracil feeding. The opposite is noted when thyroxin is administered. The changes observed in the salivary flow seem to be correlated with differences in caries susceptibility.

6. There is increasing evidence to support a three-way relationship involving the salivary glands, gonads and thyroid gland.

7. Data indicate that both the salivary glands and the thyroid gland participate in iodine metabolism.

8. Desalivation causes histologic changes in the adrenal glands and the alarm reaction has been reported to involve histologic changes in the salivary glands. This suggests a relationship between the adrenal and salivary glands, possibly through the stress phenomenon.

9. Clinical evidence is accumulating that psychopathic patients and normal patients under stress have a reduced quantity of cholinesterase in their saliva.

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### Reflex tone in the tongue muscles (electrophysiological investigation)

B. T. Turusbekov. *Bul.Exper.Biol.& Med.,USSR* 44:1431-1433 Dec. 1957

Tone in skeletal muscles is maintained by reflex action. One of its important features is that it is capable of maintaining organs in a definite position without noticeable signs of fatigue. Hitherto, the reflex mechanisms of the tongue muscles have not been investigated. The present work is devoted to an investigation of this problem.

The muscle tone of the tongue in anesthetized cats was recorded with a myograph and an electromyograph. The proprioceptors of the tongue were stimulated by stretching the tongue with a load of 20, 50, 100 and 200 Gm. The duration of the stimulus was from 0.1 to 5.0 seconds. A pneumatic method was used to record the stimulus on film.

It was established that the more the tongue is stretched, the greater its electric activity, that is, the more pronounced the proprioceptive reflex of stretching. Sectioning of the hypoglossal nerve destroys the tonus of the tongue muscles "at rest" and also destroys the proprioceptive reflexes to stretching.

The normal tone of the tongue muscles and the potentials associated with it are reflex in nature and closely associated with the lingual nerve centers. Proprioceptor impulses from the tongue muscles pass into the central nervous system, causing tonic excitation of the centers controlling the tongue muscles.

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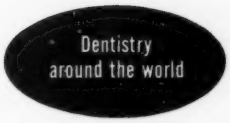


## Dentistry in South America
## I. Argentina

L. Castagnola. *Schweiz.Mschr.Zahnhk.* 68:499-503 June 1958

Argentina, with a population of 20,000,000, has at present about 9,500 licensed dentists of whom about 4,500 practice in Buenos Aires. Many women practice dentistry. The nationwide ratio between dentists and patients is about 1:2,000.

In 1951, there were 1,152 dental students (467 women), but in 1956, among 3,290 dental students were 1,425 women.

In Buenos Aires, unlicensed dental practice is rarely encountered. In the smaller cities and the rural communities, however, dental quackery is quite frequent and flourishes because of lack of governmental control. Organized dentistry finds hardly any support by the population or the authorities in its fight against unlawful dental practice.

Several regional dental societies form the Asociación Odontológica Argentina (A.O.A.) which functions in its own building in Buenos Aires where it maintains a permanent staff of 18 full-time employees.

Postgraduate courses, covering the fields of all dental specialties, are held regularly at the A.O.A. headquarters. In 1957, more than 50 such courses were given by Argentine and foreign specialists.

The leading dental journal is the *Revista de la Asociación Odontológica Argentina,* a monthly with a circulation of about 4,000 copies.

The A.O.A. maintains a dental library which contains more than 6,000 volumes and 317 dental periodicals from 46 countries.

The A.O.A. publishes an *Index to the Dental Literature in the Spanish and Portuguese Languages.*

Dental education (after 12 years of precollege study—seven years primary and five years secondary education) consists of a five year curriculum (covering 21 dental and medicodental subjects). After passing the final examination at one of the four dental colleges, associated with the Universities of Buenos Aires, Córdoba, Rosario and Tucumán, the graduate student receives the degree of *Doctor en Odontológia,* which is comparable with the degree D.D.S. (United States) or *Dr.med.dent.* (Germany and Switzerland). In 1955, 315 students graduated.

Only a few dental clinics have been established in public schools. This work, however, is progressing.

Fluoridation of drinking water, as a caries-preventive procedure, has been approved by the public health authorities, but still has not been initiated.

Dental fees are unrestricted, and are sufficiently high to secure every dental practitioner an adequate living standard. For the young dentist or the one newly arrived from another country, the rural districts provide better possibilities for a new dental practice than the larger cities.

As in most South American countries, dental research in Argentina is limited to a comparatively small number of scientists (Cabrini, Maisto, Saizar, and a few others).

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## Dentistry in South America
## II. Uruguay

L. Castagnola. *Schweiz.Mschr.Zahnhk.* 68:499-503 June 1958

Uruguay, with a population of about 2,500,000, has at present about 1,600 licensed dentists of whom 50 per cent practice in Montevideo. Many women practice dentistry. The nationwide ratio between dentists and patient is about 1:1,500.

In 1957, there were 1,092 dental students (536 women).

Illegal dentistry is practiced by about 300 men and women. Governmental control of dental charlatanism is inadequate. Violators of the new Dental Law are seldom arrested and punished. Additional legal procedures, urgently required by the dental profession, are under discussion.

Only a few dentists born or educated in countries other than Uruguay practice in Montevideo: none in the rural regions.

District dental societies form the Asociación Odontológica Uruguaya (A.O.U.) which has at present about 1,000 members. This association functions in a government-owned building which also houses other professional organizations. The erection of a building for the A.O.U. is in the planning stage.

Postgraduate courses, sponsored by the association and the Dental Faculty of the University of Montevideo, are available to dental practitioners.

Only one dental journal, the *Odontologica Uruguaya,* exists. It is published by the A.O.U.

The association maintains a dental library which contains more than 1,000 volumes. The most important international dental journals are available to members of the association and to dental students.

Dental education in Uruguay is almost similar to that in Argentina. An identical degree, *Doctor en Odontológia,* is bestowed on graduate students.

Only one dental school, the Dental Faculty of the University of Montevideo, exists. Since 1921 it has been independent from the Medical Faculty. About 50 dental students graduate every year.

Many schools have dental clinics. Complete dental service is rendered without charge to all pupils.

Fluoridation of drinking water is being discussed by the association and the public health authorities.

Minimum dental fees are stipulated by the A.O.U.

Orthodontics is the only specialty that is practiced.

The prospects for young dentists or those from other countries to build up a dental practice are excellent.

Dental research is limited to a comparatively small number of scientists (Romelli, Laiolo, Navia, and Reboredo).

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General

## A new method for measuring tooth mobility

A. A. Joel. *D.Practitioner* 8:329-332
June 1958

In Mühlemann's method (1954) of measuring the linear movement of the incisal edge of a tooth, a rod is placed a known distance from the tooth's incisal edge. This rod is connected by a spring mechanism to a dial indicator which is anchored inside the mouth by being attached to a firm molar tooth with a rubber dam clamp. Consequently, the pointer on the dial indicator shows the linear movement of the rod and hence the linear movement of the tooth at that point. Although such a measurement avoids any error due to head movement, there are several disadvantages: (1) the dial indicator is expensive; (2) the method measures only linear movement, and (3) if one wishes to compare the mobilities of different teeth, a radial measurement showing the number of degrees or minutes which the tooth has moved about its fulcrum must be obtained.

The new method for measuring tooth mobility differs from Mühlemann's dial indicator method in the following ways: (1) it costs nothing; (2) it measures the radial movement of the tooth; (3) the movement is greatly magnified, and (4) it employs a means of ensuring that head movement does not affect the result.

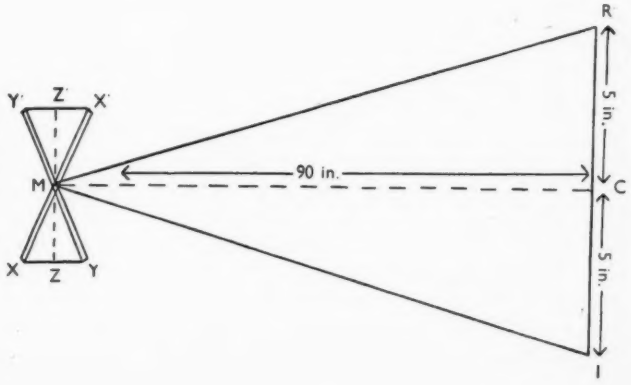
A light is shone on a mirror attached to the tooth and the tooth movement is shown by the reflected image on the opposite wall or on any suitable surface. Another mirror is attached to a tooth some distance away, and if this reflected image stays still, then the measurement is an accurate one since this mirror is used to check any head movement. A Rathbone spotlight is used as a source of light. The tiny mirrors are mounted with Plasticine on a gutta-percha block stuck to the tooth. This mounting allows the mirror to be adjusted quickly and simply. The tooth is moved by being pulled and pushed with a cement spatula in which a V-notch has been cut.

The method is an adaptation of a well-recognized method of measuring small electrical currents.

The illustration shows how the angle of movement of the tooth may be calculated. The setup was arranged to keep both the mathematics and the optics uncomplicated. In the arrangement used, 10 inches of movement of the reflected image represented 380 minutes of movement of the tooth. A tooth with 38 minutes of movement would have a linear movement at the incisal edge of the order of 0.05 mm.

This method of measuring tooth mobility is accurate, simple to apply, inexpensive, and capable of perfect reproduction if the operatory can be fully darkened.

*National Bank Chambers, Wangannui, New Zealand*




C = Reflected image at rest (the light source should be near this point). M = Center of mirror placed on tooth. X'Y'Z' = Top of mirror (or incisal edge of tooth) in its various positions. XYZ = Bottom of mirror in its various positions as the tooth is rotated. By trigonometry it is simple to calculate the angle RMI which is the angle of tooth movement

### Public attitude toward dentistry

Harold C. Reppert, William J. Updegrave and Joseph I. Shaffer. *J.Am.Col.Den.* 25:131-144 June 1958

A pilot study of attitudes of the general population toward dentistry was sponsored by the Philadelphia Section of the American College of Dentists and by the School of Dentistry and the Department of Psychology, Temple University. The study was based on interviews of 1,000 subjects by means of an interview questionnaire consisting of 46 items. The interviews were made during the 1957 Easter vacation by 131 members of the junior class of the Temple University School of Dentistry. Of the 1,000 persons interviewed, 45.8 per cent were men and 54.2 per cent were women; the median age was 36 years. The persons interviewed were selected from five occupational groups. The questionnaire covered four general areas: (1) business practices of the dentist; (2) public attitudes toward the professional competence of the dentist; (3) attitudes toward the dental profession other than its professional aspects, and (4) dental habits of the general public.

The data show that 78.9 per cent of those interviewed were reminded of the necessity for periodic checkups by their dentists. Some 78.6 per cent reported no difficulty in getting a dental appointment, and 85.6 per cent found their dentist's office to be located conveniently. Of the group surveyed, 87.6 per cent found the waiting room of their dentist's office a pleasant place; 87.0 per cent reported their dentist was prompt in keeping appointments. Among the respondents, 65.2 per cent felt that the charges made by their dentist were moderate, 21 per cent considered them high and 8.2 per cent thought them low.

Seventy-four per cent of the group interviewed said they believed their dentist used the most modern technics, 16.8 per cent answered "don't know," and 7.5 per cent answered "no." Of those interviewed, 20.7 per cent were dissatisfied at some time or other with the dental care they had received. Some 60.5 per cent of the respondents said their dentists were among the best in the field. Some 33 per cent reported suffering pain or extreme discomfort during dental treatment. Less than half (40.1 per cent) felt the equipment used by their dentist was modern; 42.4 per cent reported the equipment as being fairly recent, and 7.6 per cent said the equipment was old.

Some 92.5 per cent of the respondents reported liking their dentist as a person, and 3 per cent did not. Some 78.2 per cent considered dentists as being among the leading professional people of the community. About 52 per cent considered their dentist active in community affairs. Among the respondents, 17 per cent felt they might like to be dentists, and 71.9 per cent reported no desire to be a dentist. Medicine was preferred to dentistry as a profession; 22.3 per cent chose dentistry, 32.3 per cent chose medicine, and 35.4 per cent chose neither.

Among respondents, 93.8 per cent had a regular dentist. Some 31.6 per cent reported having changed their dentists in the last five years. Some 24.7 per cent changed dentists because of dissatisfaction with dental service, 5.1 per cent because of dissatisfaction with fees, and 14.6 per cent because they wanted a change. Of the group studied, 27.6 per cent had visited their dentist once in the past year and 33.5 per cent, twice. About 46.4 per cent were uncomfortable at the thought of going to a dentist. Only 17.3 per cent of the respondents said they would go to a dentist who used hypnosis. Some 63.8 per cent went to a dentist who usually employed a nurse, a dental hygienist or secretary as an assistant. When these 638 persons were asked if they objected to having a dental hygienist clean their teeth, 69 per cent did not object and 16 per cent did. Some 42.2 per cent felt there were enough dentists. Some 77.3 per cent reported that their dentist used roentgenograms.

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### Medical and dental research in Germany

G. Latsch. *German M.Monthly* 3:134-135 April 1958

Concern over the future of research in Germany, especially medical and dental research, has been growing steadily since 1945. The demand for more, and better paid, positions for researchers, clinicians and technicians, urgent pleas to the

German Federal Government for more and higher grants, and the ever-increasing number of applications for grants submitted to the German Research Association are clear indications of the present unsatisfactory condition of research in Germany.

Applications for grants for medical and dental research projects, submitted to the German Research Association, are referred to a committee consisting of three specialists (nominated or elected by their professional associations). This committee evaluates the merits of each research project and examines the qualifications of each applicant and stipulates the amount of money required.

Sometimes colleges or individual clinicians apply for a grant to pay assistants because otherwise their clinical work would not permit them to carry out research work or to make the necessary equipment available. Rejecting this type of application is sometimes difficult.

Based on proposals made by both the German Medical Association and the German Dental Association, the German Research Association made the following suggestions to improve the situation:

1. Funds should be made available to provide medical and dental schools and their laboratories with an adequate research staff and up-to-date equipment.

2. There should be more and better paid positions for research workers and technicians in hospitals and clinics. These hospitals, important for dental and medical education, are expected to combine clinical work with research and teaching.

3. There should be more opportunities for paid leaves of absence to pursue definite research projects.

4. Dental and medical educators with adequate scientific training should be enabled to devote a reasonable amount of time to research.

5. Cooperation between clinicians, educators and researchers in all fields of medicine and dentistry should be encouraged.

6. Special institutes for experimental medicine and dentistry should be established in which clinical research problems are investigated.

7. Clinical departments of medical and dental schools (and hospitals in which medicine or dentistry are taught) should have independent research units.

The advantages of such a procedure would be as follows:

1. Clinicians, researchers and technicians would be brought into close contact with each other.

2. Dental or medical research would remain free from interference by clinical work.

3. Continuity of each research project would be reasonably assured.

In 1956, the German Research Association submitted these proposals for discussion to representatives of the medical and dental faculties of the universities and of the professional associations, to independent clinicians and researchers of both professions and to the public health authorities.

After many favorable answers and some additional suggestions were received, the proposal was submitted to the German Federal Government where it is now under consideration.

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## The personality of the dentist as a factor in practice administration

James B. Bush. *Iowa D.J.* 44:149-152 June 1958

Since the average dental patient is in no position to evaluate the quality of the dental treatment he receives, he probably judges the dentist on the basis of personality, physical surroundings and auxiliary personnel. The personality of the dentist is an important factor in practice administration.

The appearance of the dentist is influenced by his carriage, clothes, habits of cleanliness, facial expressions and mannerisms. An upright man commonly is thought to have an upright character. Extremes in clothing should be avoided. The ceremony of dentist and assistant washing their hands and the placing of clean, sterile instruments on the bracket table after the patient is seated are not a waste of time. To look into the patient's eyes while addressing him, and to stand or sit in a relaxed but not a sloppy manner are examples of actions which project meaning to the patient.

Expression, action and appearance are more important in producing a reaction than the words used. The dentist can learn to like people by searching for some trait to admire, by going out to them with a friendly gesture and expression before they act, and by trying to understand them. Success and happiness depend on the attitude and action of other people toward us, and the attitude of others depends on our attitude toward them.

A winning personality is accomplished by having sincere, honest motives; an upright, clean appearance; a smiling, optimistic outlook; facial expressions and actions which suggest enthusiasm and self-confidence; by making an effort to understand the other fellow's point of view. Pleasing personality traits do not just happen, they develop as a result of self-evaluation and conscientious effort to be the kind of person most people like.

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**Manual of speech disorders**

Herold Lillywhite. *J.A.M.A.* 167:850-858 June 14, 1958

Deviations from normal speech usually are thought of as falling into one or more of the following categories:

1. Defects in phonetic articulation. Deviations in articulation account for from 50 to 70 per cent of all speech disorders.

2. Stuttering and stammering account for about 25 per cent of all speech disorders and can be divided into primary and secondary stages, the latter being the stage at which the patient considers nonfluency to be a serious problem.

3. Voice defects include about 10 per cent of all speech disorders and refer to the processes of phonation and resonation and include deviations of pitch, quality and volume.

4. Symbolization, which refers to language disturbances such as aphasia or dysphasia, is characterized by an inability to associate meaning with language symbols. From 2 to 4 per cent of all speech disorders may fall into this category.

The phoniatrician, however, uses other classifications and terms such as speech delay (in which one or more aspects of language, articulation, vocabulary or sound structure did not develop according to the patient's chronological age); dyslalia (articulation disorder due to structural anomaly, impaired hearing or "functional" causes); dysarthria (articulation disorder due to damage to the central nervous system affecting speech organs); dysphonia (defect of the quality, pitch or volume of the voice); dysphasia (defined under symbolization); defects in speech rhythm (stuttering, stammering or cluttering); hypernasality and hyponasality.

Late physical development may cause retarded coordination and faulty function of speech organs. There are two types: (1) delay in developing intelligible speech, and (2) articulatory distortion usually following a retarded speech pattern.

Tooth misalignment and malocclusion are most likely to cause articulation problems such as the distortion of the sibilant sounds (s and sh). Immediate orthodontic treatment is the most direct remedy, but speech therapy frequently is required as a supplementary procedure.

Cleft lip and palate often cause speech retardation because the consonant sounds (p, b, t, d, k and g) needed by the child to establish his early vocabulary are disturbed by the cleft. Because of this defect, a large part of the prelanguage activity is omitted and the early vocabulary and sound discrimination remain imperfect even after successful surgical closure. In patients with clefts in the soft palate, a hypernasal quality often remains after surgical closure, due to an insufficient closing in the velopharyngeal region. Cleft lip, jaw and palate are frequently accompanied by tooth malformations or faulty tongue placements which develop before the cleft is surgically closed.

Early counsel and instruction in speech development are essential for the parents of children with cleft lip, jaws or palate. Most of the delay in speech can be prevented by speech pathologists.

Successful surgical closure of clefts is adequate to prevent postoperative hypernasality, but there is not always a close relation between the length and flexibility of the palate and the degree of hypernasality. A small nasopharyngeal leak may produce as much hypernasal quality as a large cleft palate. "Pharyngeal flap" and "pushback"

have been found to be effective surgical technics in many instances. Dental treatments often remove articulation defects due to faulty tooth alignment. Speech therapy, if required, should be initiated before the cleft palate patient is four years old.

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### Dental technicians in Latin America

Ernesto Cohn. *Bl.Zahnhk.,Zürich* 19:74 May 1958

Conservative and preventive dentistry have recently become major fields of dental practice in most Latin-American republics. In these countries, fewer teeth are extracted and fewer dentures or bridges are inserted than in the United States.

Although the quality of prosthetic work performed by Latin-American dentists is of a high standard, the status of dental technicians in those countries has been the subject of much critical examination and discussion.

The dentist who is able and willing to delegate the purely mechanical (technical) parts of prosthetic work to the dental technician, although under supervision and control, will be free to turn his attention to the more important work such as clinical dental care, dental treatment and dental research. Generally, however, the Latin-American dentist is not yet willing to accept even a qualified dental technician as an important, sometimes indispensable, co-worker. Obviously, the craft of dental technicians is of a nature that makes great demands on the person entering it, if he wishes to obtain a high degree of skill and ability and to keep in step with the rapid technical developments of today.

Economic consideration and theoretical instruction of dental technicians receive far too little attention in most Latin-American countries. The trend of development in dental technology demands a fundamental knowledge of chemistry and physics. A thorough knowledge of dental materials and technics is required by the dental technician. In instructing a dental technician, the dentist often uses a language which the technician cannot understand.

Only in Argentina is there a professional organization of dental technicians. In Mexico or Brazil, where most of the professional groups are organized, no such associations exist. There are also no governmental agencies to plan a uniform system of training, theoretical and practical, for dental technicians.

This unfortunate situation has produced an unfortunate line of demarcation between the work of the college-educated dentist and the often inadequately trained dental technician. Every dentist who employs a technician uses his own training methods. Instances are not uncommon where the technician is permitted to carry out work on the patient, such as impression taking, fitting of dentures or color selection. It is, therefore, not surprising, that a number of these technicians began to solicit and treat patients. Their practice, however, is by no means restricted to prosthetic procedures. This pretense of possessing dental skills is shared by butchers, carpenters, bricklayers and shepherds, as well as by pharmacists and veterinarians, who—almost overnight—decided to enter the dental field.

In some Latin-American countries, especially Mexico, there are laws regulating quackery on the books, but dental charlatanry seldom is placed under the jurisdiction of the court and remains unchecked.

The problems of the status of dental technicians and of dental quackery will be discussed at the next meeting of the Mexican Dental Association which will be held in Mexico City in November 1958.

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## Doctoral and Masters' dissertations

*In this column each month are listed recent Doctoral and Masters' dissertations of dental interest, accepted by the dental schools or graduate schools in partial fulfillment for advanced degrees. Copies of many of these theses are available from the schools through interlibrary loan.*

A critical analysis of the anti-microbial effectiveness of dyclonine hydrochloride (4-N-butoxy-beta-piperidinopropiophenone hydrochloride) in infected root canals. *Harry J. Healey. 1958.* M.S.D. *Indiana University.*

Heat treatment of orthodontic steel wire. *Paul I. Denver. 1958.* M.S.D. *Indiana University.*

Normal postural changes of the soft tissue facial profile during function. *Warren Hamula. 1958.* M.S.D. *Indiana University.*

A cephalometric study of mandibular morphology, with special reference to the denture supporting and muscle attachment areas. *John B. Carson. 1958.* M.S. *University of Michigan.*

Changes of mechanical properties of hypodermic needles as influenced by disinfection, sterilization and use. *Horacio Cruz-Jasso. 1958.* M.S. *University of Michigan.*

A roentgenographic cephalometric study of the tongue. *Donald F. Eifert. 1958.* M.S. *University of Michigan.*

Physiologic gingival contour and an objective method for its studying. *Lennart Eneroth. 1958.* M.S. *University of Michigan.*

Intraoral pressures involved in thumb and finger sucking. *James Edward Cook. 1958.* M.S. *University of Michigan.*

A serial study of the dentition and apical base relationships in Class I malocclusion. *Alan L. Gans. 1958.* M.S. *University of Michigan.*

A radiographic method of basilar cephalometrics. *Daniel H. Gilbert. 1958.* M.S. *University of Michigan.*

An electromyographic and cephalometric radiographic investigation of variation in mandibular position in relation to head position. *Harry L. Vanoucek. 1958.* M.S.D. *Northwestern University.*

A metallographic study of the welded bond between two pieces of stainless steel bond material. *Raymond J. Vassar. 1958.* M.S.D. *Northwestern University.*

An investigation of the changes in the palatal process when pressure is applied to specific areas. *Howard Luke Marin. 1957.* M.SC. *Ohio State University.*

A study of some of the stresses induced upon the abutment tooth by the partial denture clasp. *Ernest Leroy Miller. 1957.* M.SC. *Ohio State University.*

An analysis of lateral cephalometric roentgenograms of adults with natural dentition and with complete dentures. *William Allen Newman. 1957.* M.SC. *Ohio State University.*

The role of epithelium in the healing of experimental extraction wounds. *Robert Leroy Smith. 1957.* M.SC. *Ohio State University.*

An electron microscopic study of human oral epithelium from herpes simplex lesions. *George Ulrich, Jr. 1957.* M.SC. *Ohio State University.*

Gingivitis and stomatitis during pregnancy (Zahnfleischerkrankungen während der Schwangerschaft). *Walter Schlegel. 1957.* DR.MED.DENT. *University of Rostock, Germany.*

Bacterial flora of the oral cavity (Die Pilzflora der Mundhöhle). *Margaret Fischer. 1957.* DR. MED.DENT. *University of Rostock, Germany.*

Roentgenoscopic examinations of the teeth after root canal treatment (Röntgenoskopische Untersuchungen an wurzelbehandelten Zähnen). *Ruth Schulz. 1957.* DR.MED.DENT. *University of Mainz, Germany.*

Investigation of the vertical dimension in "closed bite" and during rest position of the mandible (Untersuchungen der Bisshöhe beim "Schlussbiss" und während der Ruhelage des Unterkiefers). *Karlheinz Beckenbach. 1957.* DR.MED.DENT. *University of Mainz, Germany.*

Histopathology of unerupted teeth, especially of impacted cuspids (Der retinierte Zahn im histopathologischen Bild mit besonderer Berücksichtigung der verlagerten Eckzähne). *Hans Eberhard Lorf. 1957.* DR.MED.DENT. *University of Cologne, Germany.*

The reducing power of human saliva: three tetrazolium salts as reducing indicators (Das Reduktionsvermögen des menschlichen Speichels: Drei Tetrazoliumsalze als Reduktionsindikatoren). *Hans Madsen. 1957.* DR.MED.DENT. *University of Cologne, Germany.*

Temperature of the oral cavity (Temperatur der Mundhöhle). *Karola Renate Schroeder. 1957.* DR.MED.DENT. *University of Würzburg, Germany.*

Transformation phenomena of transplanted bones used in restoration of a mandibular defect (Über Umbauerscheinungen am transplantierten Knochen zur Deckung eines Unterkieferdefektes). *Reimut Böwering. 1957.* DR.MED.DENT. *Medical Academy of Düsseldorf, Germany.*

The teeth as portal of entry for systemic diseases (Das Zahnsystem als Eintrittspforte für Allgemeinerkrankungen). *Elisabeth Herrmann. 1957.* DR.MED.DENT. *Medical Academy of Düsseldorf, Germany.*

Graphic representation of tooth extraction technics (Die bildliche Darstellung der zahnärztlichen Extraktionstechnik). *Rolf Josef Maiburg. 1957.* DR.MED.DENT. *Medical Academy of Düsseldorf, Germany.*

Formation of secondary dentin (La formazione della dentina secondaria). *Sergio Molignani. 1957.* SPEC.ODONT. *School for Dental Specialties, University of Pavia, Italy.*

Dental cysts: pathogenesis and treatment (Le cisti dentarie: clinica e terapia). *Vincenzo Giandomenico. 1957* SPEC.ODONT. *School for Dental Specialties, University of Pavia, Italy.*

Reimplantation of teeth (Il reimpianto dentario) *Nicola Favia. 1957.* SPEC.ODONT. *School for Dental Specialties, University of Bari, Italy.*

Mikulicz's disease and Mikulicz's syndrome (Malattia di Mikulicz e syndrome di Mikulicz). *Antonio Ventrelli. 1957.* SPEC.ODONT. *School for Dental Specialties, University of Bari, Italy.*

Fibroma of the upper jaw (Fibromi delle ossa mascellari). *Camillo Bulferetti. 1957.* SPEC. ODONT. *School for Dental Specialties, University of Bari, Italy.*

Technic and critical analysis of procedures with "airbrasive" in dental practice (Tecnica ed analisi critica dei procedimenti col "airbrasive" nella practica odontoiatrica). *Bernardi Kalma Szolder. 1957.* SPEC.ODONT. *School for Dental Specialties, University of Bari, Italy.*

Surgical technics in ankylosis of the temporomandibular joint (Metodi operatori nell' anchilosi temporo-mandibolare). *Francesco Elefante. 1957.* SPEC.ODONT. *School for Dental Specialties, University of Bari, Italy.*

Etiology, pathogenesis and treatment of impacted teeth (Etiologia, patogenesi e terapia delle ritenzione dentaria). *A. Codebo. 1957.* DR.MED.DENT. *Dental School of the University of Milan, Italy.*

Treatment of focal dental infection (Terapia delle affezioni focali dentaria). *D. Burzi. 1957.* DR. MED.DENT. *Dental School of the University of Milan, Italy.*

Analgesia in dentistry (L' analgesia in stomatologia). *A. Ceresa. 1957.* DR.MED.DENT. *Dental School of the University of Milan, Italy.*

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